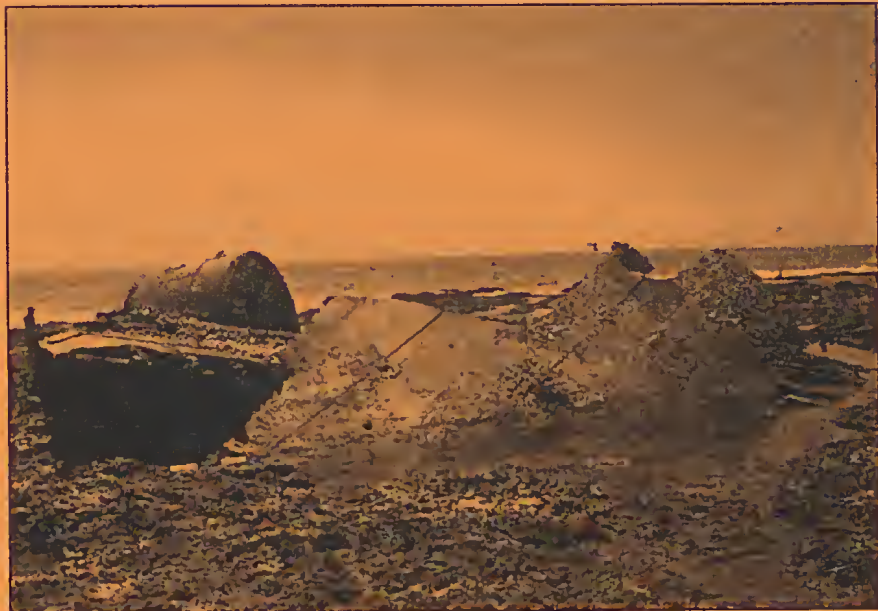


MAGNT RESEARCH REPORT No. 10
JANUARY 2005

THE HISTORIC SHIPWRECK *SS BRISBANE* (1874-1881)

A PLAN OF MANAGEMENT

DAVID STEINBERG



Museums and Art Galleries of the Northern Territory

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First printed January 2005

ISSN 1444-8939 Print

ISSN 1447-1981 Online

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Supported by the Historic Shipwrecks Program



Australian Government

Department of the Environment and Heritage



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LIST OF ABBREVIATIONS

AIMA	Australasian Institute for Maritime Archaeology
AUS	Australian Admiralty or Nautical Chart
BC	Brisbane Courier
BI	British India Steam Navigation Company or British India Company
E&A	Eastern and Australian Steamship Company or Eastern and Australian Mail Steam Company
ICGR	Incoming Correspondence of the Government Resident
LAT	Latitude
MAGNT	Museum and Art Gallery of the Northern Territory
GR	Northern Territory Government Resident Report
NTTG	Northern Territory News and Gazette
P&O	Peninsular and Oriental Steam Navigation Company
RSR	Report of survey of repairs
SMH	Sydney Morning Herald

GLOSSARY OF TERMS

The definitions below specifically suit the *SS Brisbane* and this project and do not necessarily serve as general definitions. As ship construction terms refer to a past vessel, the past tense has been used.

Anchors: bower, stream and ketch

The bower anchors were the largest anchors aboard a vessel and were stored at the bow. They remained attached to the chain so could be deployed quickly. The stream and ketch anchors were smaller than the bowers, the ketch being smaller again than the stream. The stream and ketch anchors were deployed from a variety of points on the deck (Kemp 1988).

Bollard

A structure used as a tying-off or holding point for a vessel.

Capstan

A steam driven cylindrical barrel used for heavy lifting work (Kemp 1988). It directed the chain from and to the storage compartment.

Condenser

A piece of equipment in a ship's engine room by which the steam, after use in the main engines, was converted into feedwater for the main boilers (Kemp 1976: 193).

Gross tonnage

A tonnage measurement that includes the maximum cargo capacity and the tonnage of the vessel itself.

Gunwale

A guard that protruded vertically above the deck and ran the length of the hull.

Hawse

The hawse was made up of the hawse hole, from where the chain ran through the hull and the pipe, which fed the chain from the hole to storage.

Historic shipwreck

In the case of the *SS Brisbane* shipwreck this term signifies its protection under heritage legislation. The term has also been used to identify that a shipwreck is of cultural significance, regardless of whether it is protected or not.

***Historic Shipwrecks Act 1976* (Commonwealth)**

The *SS Brisbane* shipwreck is protected under this legislation, following the 1993 amendment automatically protecting all shipwrecks in Commonwealth waters that are over 75 years of age.

Neap tide cycle

Close to the equator the tide cycle is characterised by a pattern in which the one month lunar cycle consists of 4 tidal phases, two spring tide cycles and two neap tide cycles. The neap tide cycle appears with the half moons and is characterised by a minor tidal difference between the high tides and low tides. In contrast the spring tide occurs with the Full and New moon and is characterised by a major tidal range between the high tides and low tides.

Palmerston

The first Port Darwin settlement was called Palmerston. It was located where the city of Darwin now stands. Historic references to Palmerston are not references to the contemporary satellite city of the same name.

Port

The left side of a vessel. The right side is the starboard side.

Registered tonnage

A tonnage measurement of the cargo capacity of a vessel, not including the weight of the vessel itself.

Sheer-strake plating

A strake is the hull sheeting that makes up the wall of the vessel. The top strake of the upper hull is located just below the gunwale (Kemp 1988).

Spring tide cycle

See neap tide cycle

Starboard

The right side of a vessel. The port side is the left side.

Superheated (boiler mechanism)

Superheating was a strategy to increase the temperature of steam and to remove moisture. Drying reduced the risk of boiler priming and reduced condensation damage to engine cylinders (Griffiths 1997: 233).

Winch

A steam-driven mechanical pulley used to haul sails, cargo and anchors.

Windlass

A large steam driven winch that was usually employed for the heaviest lifting, for example, the bower anchors.

THE HISTORIC SHIPWRECK SS *BRISBANE* (1874-1881)

A PLAN OF MANAGEMENT

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PREFACE

This final report is the culmination of a review process in which two earlier draft reports were produced. Over the course of the project stakeholders, which includes public groups, were contacted. The second draft report was circulated to government agencies and colleagues for professional review.

Feedback received from government agencies and key stakeholders was considered in the production of this report.

ABSTRACT

Built in 1874 by Inglis of Scotland and commissioned by the Eastern and Australian Mail Steam Company, *SS Brisbane* steamship joined a fleet of ships that became pioneers in the development of the Torres Strait passage between Asia and eastern Australia.

As an immigrant ship, the *SS Brisbane* brought hundreds of Chinese immigrants to Australia. It provided a passenger and cargo service for the Northern Territory connecting it with Asia and other ports in Australia, and in later years it delivered the northern settlement's mail.

On 10 October 1881 the ship struck Fish Reef located approximately 25 nautical miles from Darwin Harbour. The ship was bound for Port Darwin from Hong Kong and it struck the reef because of a navigation error. No one was killed but the ship was a loss.

It is one of only a small number of 19th century shipwrecks that have been located and identified in the Northern Territory, and is the only recorded shipwreck in the Northern Territory that was wrecked when bringing Chinese immigrants to Australia.

The wreck is considerably broken up and a good deal of material has been removed by natural forces and salvage; therefore the site does not offer a complete collection of cultural items. Regardless, there are items such as ceramic shards that could perhaps contribute to a material culture study of imported goods from Asia or the belongings of Chinese immigrants.

Although the wreck provides only an incomplete inventory of the secondary machinery that was aboard, what does exist can contribute to a study in maritime technology. The

SS Brisbane was built during a dynamic time in steamship engineering and the technical remains represent a specific stage in this evolution.

The site is a rare educational resource because there are few 19th century shipwrecks in the Northern Territory. Furthermore, the site offers various levels of access, providing an experience for scuba divers, those swimming with snorkel gear and those who choose to explore wreckage and machinery on foot during extreme low tides. The ability to provide a variety of access options opens up visitation to the wider community, and so the possibilities in terms of on-site interpretation are considerable.

The shipwreck is of social significance to the Chinese community of the Northern Territory, as represented by the Chung Wah Society, for its association with Chinese immigration.

Of the management issues discussed in the report, the leading concern is salvage by recreational divers. Over the years it has caused disturbance and damage to the shipwreck, compromised its integrity as an archaeological site and resulted in relics from the wreck being held by a number of people in private and exclusive collections. No relics held in private collections are registered, and so these are held illegally.

The recommendations for the management of this site are that the State Delegate inform the Commonwealth Department for the Environment and Heritage that salvage by recreational divers is a major threat to the site, the production of a brochure, the design and installation of a display at the Chinese Museum, the production of a laminated site plan card for visitors and the production of an underwater plinth.

ACKNOWLEDGMENTS

I would firstly like to thank the Commonwealth Department for Heritage and the Environment for providing the funds for this project.

I would also like to thank those who have assisted in historical research. These are: Francoise Barr and Cathy Flint of the Northern Territory Archives; staff of the Northern Territory Library, Alan Giddings and M. Sampson of the National Maritime Museum Greenwich England; Dr Charles Kelham of the Glasgow City Council; Warwick Foote, Queensland Maritime Museum; Captain David Hancox; Mr Labrum; Brett Mitchell of the Naval History Directorate, Department of Defence; Kevin Slade, Department of Defence; Glenys Diamond and members of the Chung Wah Society and Doug Robertson of the Australian Maritime Safety Authority.

I would also like to thank those who have contributed information relating to recreational use of the site, raised relics and those who contributed suggestions regarding the site's management. These are: Ross Anderson, Heritage Victoria; Marine Branch, Transport and Works; Fisheries section, Department of Business, Industry and Resource Development; Dr Colin Jack-Hinton, previous Director of the Museum and Art Gallery of the Northern Territory (MAGNT); Phil Franklin; Mick Henderson; Rob Williams; Don Ross; George Tyres; Andy Hanlon; Trevor Hosy; Suzie Lac and Sash Muller of Coral Divers; Rick Weiss of Cullen Bay Dive and members of the Sub Aqua Club.

I would also like to thank those who have participated in or contributed to archaeological fieldwork. These are: Silvano Jung; Paul Clark, Gavin Dally and Steven Gregg, MAGNT; Clayton Fredricksen, Northern Territory University; Cullen Bay Dive; Barefoot Marine and Jo Boyanton. Specific acknowledgment should be extended to Cullen Bay Dive for the loan of an underwater camera.

Thanks also to the MAGNT Collection Management and Conservation staff for assistance relating to relics within the MAGNT collection.

Finally thanks to Anna Davis for proof reading and encouragement.

CHAPTER 1: THE ROLE AND SCOPE OF THIS PLAN

The *SS Brisbane* shipwreck is protected under the *Commonwealth's Historic Shipwrecks Act 1976*. It gained protection following the 1993 legislative amendment, which declared all shipwrecks older than 75 years and located in Commonwealth waters protected.

The delegated authority for the administration of this legislation within the Northern Territory is the Director of the Museums and Art Galleries of the Northern Territory (MAGNT).

Funds to produce this plan were provided through the Historic Shipwrecks Program, a program administrated by the Commonwealth Department for Heritage and the Environment.

A conservation/management plan is necessary to assure the successful protection and management of an historic shipwreck as a cultural resource (AIMA 1994: 5-13).

The role of this management plan is:

- to assess the significance of the site;
- to provide a policy framework for the management of the site;
- to identify the major stakeholders in the management of the site;
- to identify threats to the site;
- to recommend controls that provide conservation and minimise impact and deterioration; and
- to offer a preliminary registry of raised relics.

Considerations regarding the scope of this report are:

- this report was produced under a project specific grant; and
- this report should be reviewed in five years.

CHAPTER 2: CONSTRUCTION, TECHNICAL DESIGN AND FACILITIES

The *SS Brisbane* was designed and constructed to be a competitive ocean-going steamship carrying passengers, general cargo and mail. This required varying passenger class accommodation and significant cargo capacity. To service tightly scheduled mail contracts within budget, the ship was also built to be fuel efficient, powerful and reliable. The technical details listed below come from the Lloyds Index of Ships and Lloyds Ship Survey and Repair Reports, all sourced from the National Maritime Museum, Greenwich.

2.1. Technical details

Built	1874
Location	Glasgow, Scotland
Builder	A&J Inglis
Port of registry	London
Hull type	iron hull, 4 decked
Rigging	two masted square sail brig
Propulsion type assistance	fully powered single screw steam with sail
Gross tonnage	1503
Registered tonnage	891
Cold cargo storage	ice-house, meat rooms
Length	281.5 feet (85.80 metres)
Breadth	32.2 feet (9.8 metres)
Depth	17.6 feet (5.40 metres)
Propulsion engine/s	inverted compound engine (2 cylinders 40" & 72" – 42" stroke) 250 registered horse power
Boilers	2 auxiliary boilers and 4 regular superheated main boilers
Ship boats	6 wooden boats
Passenger facilities	first, second and steerage class

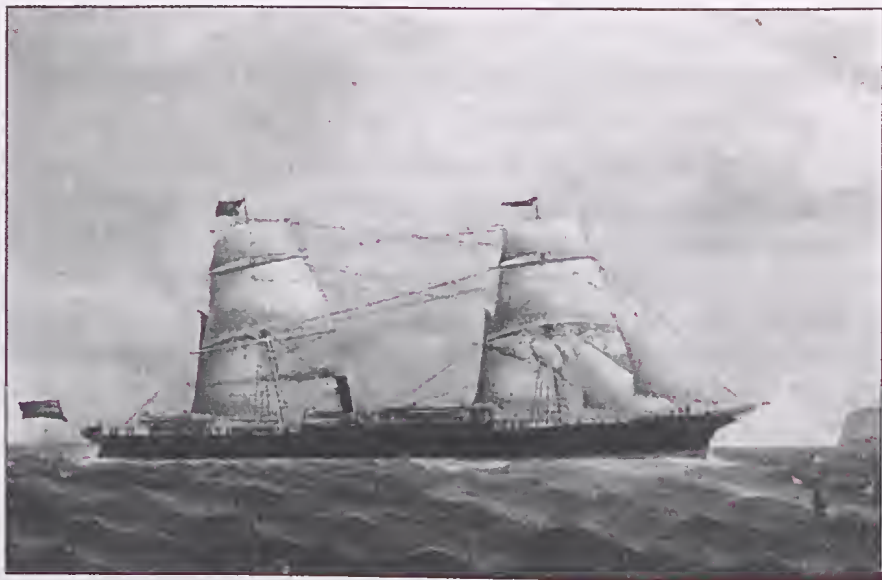


Fig. 1. The *SS Brisbane* (Queensland Maritime Museum Association)

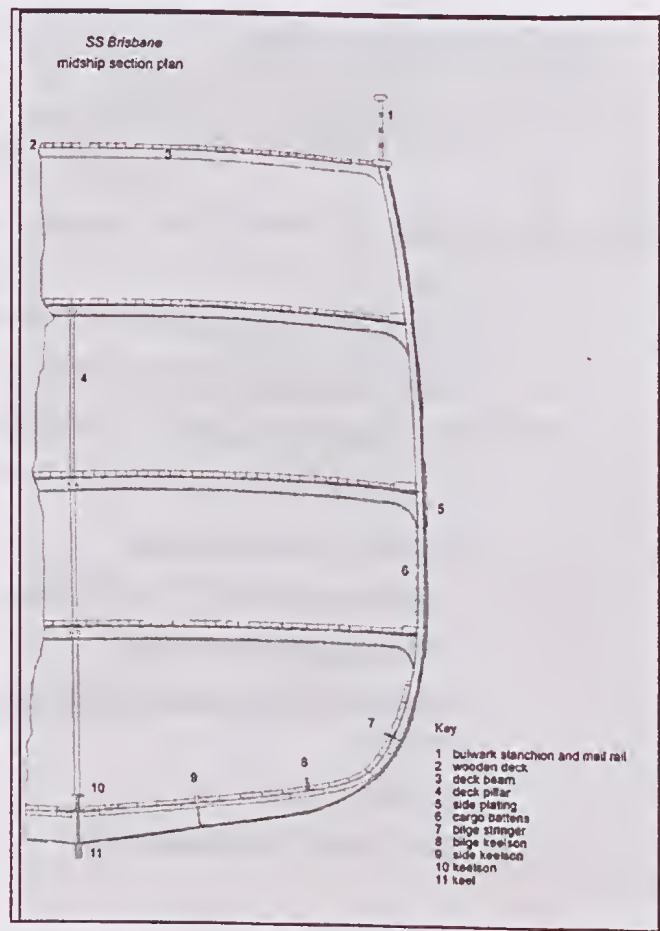


Fig. 2. Hull cross section (drawn from ship plans supplied by National Maritime Museum, Greenwich, England)

2.2. Passenger accommodation and general facilities

To accommodate passengers there were 38 berths in First Class, 40 berths in Second Class and an unspecified number of places in Steerage (BC 30 January 1875). Two sources offer an idea of what conditions aboard were like for passengers.

The following excerpt was written by a journalist following a tour of the ship while it was moored in Morton Bay, Queensland (BC 30 January 1875). The ship was on its maiden voyage. It describes the passenger accommodation and various facilities such as the galley (kitchen).

‘Of the passenger accommodation it may be remarked that the main saloon is a spacious and well ventilated apartment, tastefully decorated in maple and walnut and with gilded mouldings and cornices, containing ten large state-rooms, each affording ample accommodation for three passengers, and the whole excellently lighted up by means of a skylight running the whole length. The ladies’ cabin and retiring-rooms are off this apartment and are furnished with every convenience for eight passengers and attached thereto is a large bath. The bathrooms and other conveniences for the accommodation of the saloon passengers, are all of the best style and fitted with the latest improvements.

The first class passengers accommodation being placed at the fore end of the vessel, well forward of the engine room, is free from all vibration, and what is of more importance is delightfully cool.

The second cabin is in the after part of the ship, and is a fine airy apartment, approached by double companion from the main deck. It contains four state rooms, besides a fair sized ladies’ cabin affording all together accommodation for forty passengers and is furnished with lavatories, bath-rooms &c., which also figure in the fixtures of that for female accommodation.

In this portion of the vessel is found the pantries, linen lockers, and other fixtures incidental to the stewards’ arrangements. The native crew and firemen are housed in the large forecabin, and the Chinese and steerage passengers are carried in the long and capacious ‘tween decks’.

The article continues with:

‘The arrangements of the cuisine include a bake-house and galley, scullery, pantries and lockers, all judiciously arranged and in close communication with the saloon...on the after main deck is accommodation for the captain, officers and engineers. Forward is a large range where the cooking is done by steam from the main boiler, besides two other stoves which prepare food for the crew and Chinese passengers. Awnings and fittings to cover the whole ship from forecabin to taffrail...’.

Another source that describes conditions aboard, particularly for the Chinese passengers in steerage, is the diary of Robert Herbertson who travelled as a passenger in 1879 (Herbertson 1879). Herbertson explains that:

‘Besides ourselves as passengers there was a large number of Chinese over 500-600, of which was (sic) coolies destined to work on the wharfs of Sydney, the remainder have leave at Port Darwin destined to try their luck on the goldfields of

the Northern Territory. They seem a queer lot huddled together between decks, like so many sheep, as far as I can see we seem pretty crammed full with them, there being very little available space.'

CHAPTER 3: RELATED HISTORIES

3.1. The *SS Brisbane*'s working life

The Eastern and Australian Mail Steam Company and the Torres Strait route. The *SS Brisbane* was commissioned by the Eastern and Australian Mail Steam Company (E&A) and remained the property of the company until its eventual stranding on Fish Reef. The company operated a fleet of fast and efficient ocean going steamships that connected the east of Australia with Asia and Europe through the Torres Strait.

The company used the mail subsidy from Queensland, and then South Australia, to help fund its efforts in servicing trade between Australia and Asia (and Europe) through the Torres Strait. This route had been navigated many times before. However the E&A was a pioneer in transforming the far north Queensland coast and the Torres Strait from a poorly charted route into a viable commercial shipping route between Asia and eastern Australia (Foley 1982: 27, Nicholson 1996: 386, Olson 1976: 19). The *SS Brisbane* ship was operational by 1875 and so played a role in the company's early achievements.

The Torres Strait passage, linking Asia and eastern Australia, remained the hallmark of the company despite the eventual loss of a lucrative Queensland mail contract and a series of company liquidations and restructuring.

The mail contracts and the creation of the fleet's itinerary. Over the history of the *SS Brisbane*'s working life it and the other ships of the E&A fleet serviced two mail contracts, the Queensland mail contract which was awarded in 1873 and the Port Darwin mail contract, paid by the South Australian government, which was awarded in 1880.

The company was formed in 1873, and its immediate job or enterprise was to service a mail contract for the Queensland government, a contract which provided an annual payment to the company of £20,000. The contract was signed on 18th April 1873 (BC 16 June 1873). It lasted until 1880. The Queensland mail contract subsidised the work of the company and made its pioneering role in providing a commercial shipping service through the Torres Strait possible.

The mail contract also did far more than just provide a mail service for regional areas. It also assured that various geographically, and economically, isolated ports received ongoing shipping activity.

Prior to the Torres Strait passage mail service, Queensland had two other mail services. One had a route that spanned the Pacific Ocean, connecting Queensland with Europe via America. This was called the 'San Francisco route' (BC 25 January 1875). The other was a service from Asia offered by the P&O (Peninsula and Oriental Steam Navigation Company).

In terms of the P&O mail service, Ceylon (Sri Lanka) was the hub between the European - Asia - Australian route. P&O mail steamships carried mail from Ceylon to the north-west coast of Australia and worked their way in an anti-clockwise direction around the continent's coast to Sydney. From Sydney, another shipping service carried mail to Queensland. In this system Brisbane could experience a further month wait once

the mails had reached even Albany (Olson 1976: 3). These delays were considered unacceptable.

The contract prescribed that E&A ships would connect Brisbane and Queensland regional ports with the P&O service to Europe by exchanging mail with P&O ships at Singapore. The company could then offer a mail, trade and passenger service between Singapore, Queensland ports and Sydney.

Hardwick (1983) outlines the conditions of the E&A contract, detailing the route, the necessary size and condition of the ships and how regularly ships will call at each port (Hardwick 1983). Every four weeks a vessel would depart Singapore and another from Sydney (Hardwick 1983: 34).

In 1880 the E&A lost the Queensland mail contract to the British India Steam Navigation Company (BI) (Olson 1976:19). The BI would provide a direct link to Britain without the need for the Singapore mail link, and BI would later be remembered as making a significant contribution to Queensland economic development (Bach 1976: 195).

In 1881, only one year following the loss of the Queensland contract, the E&A company was awarded a smaller contract with the South Australian government to provide a Port Darwin mail service. The contract offered the company an annual sum of £2,000 (NTTG 27/5/1882). As E&A ships did not reach Adelaide, a connecting service would take mail, passenger and cargo from Melbourne. This contract persisted until the end of South Australia's control of the Northern Territory in 1911. Until the establishment of this contract the E&A fleet visited Port Darwin only when there was financial incentive to do so.

The ship's itinerary. The initial itinerary for the ships was set by the conditions of the Queensland mail contract, but the company quickly extended its service beyond this.

There are different versions of the initial fleet itinerary found in historical sources. The E&A handbook for passengers dated 1875 lists the ports as being Singapore, Batavia (Jakarta) Samarang, Sourabaya, Somerset (Cape York Peninsula), and the Queensland ports of Townsville, Bowen, Keppel Bay and Brisbane and finally Sydney (E&A 1875, Hardwick 1983:34). The original route from Singapore to Sydney was 8,1612 miles in length (Olson 1976: 10).

Thursday Island soon replaced Somerset, the *SS Brisbane* being credited as the first ocean going ship to call at the new port (Nicholson 1996: 261). Hong Kong, and Melbourne were also quickly added to the itinerary. In terms of Port Darwin, prior to the South Australian mail contract, ships only stopped there when there was sufficient economic incentive to do so (Olson 1976: 15, NTTG 31/1/1880).

The map below shows the likely route for E&A ships in 1881. By this time Singapore was no longer a port of call. The map may present minor errors, as some of the information is based on circumstantial evidence. Furthermore not every port listed on the itinerary was visited each time, as many minor ports were only visited when there was financial incentive to do so.



Fig. 3. Map of fleet's route in 1881

The cargo and passenger trade of the *SS Brisbane*. The Queensland and South Australian mail contracts partly subsidised the E&A in its efforts to run a competitive service transporting goods and passengers. During the operational period of the *SS Brisbane*, the E&A ran a shipping service that stretched across a chain of ports from Victoria to China. The company was certainly able to expand beyond the set itinerary of the mail contract, for example expanding to Hong Kong and, after the stranding of the *SS Brisbane*, to Manila and Japan. Therefore the label of 'mail steamer' can be misleading, by ignoring the significant role of the *SS Brisbane* as a passenger and cargo ship.

In geographical terms this trade could be described as *intra-State* in nature, serving key ports in Queensland, *inter-State* in nature, servicing trade between the Australian colonies and *international* in nature, connecting Australian ports with the Indonesian archipelago, Singapore and China. The trade consisted of the transport of a variety of cargo, the transport of passengers and in particular the transport of Chinese immigrants.

Much of the evidence on what goods were imported to Australia is circumstantial. From the salvage accounts of the *SS Brisbane* shipwreck we know that exotic goods such as ornaments, jewellery, spices, tea and opium, and manufactured goods such as silk and bamboo blinds were bound for Australian ports (NTTG 29 October 1881, SMH 26

October 1881; SMH 28 October 1881 6c; BC 30 November 1875; BC 30 November 1875).

Determining Australian exports which were carried aboard the *SS Brisbane* is also difficult because the evidence is circumstantial, and because the shipping news mentions the overall size of consignments but did not provide an itemised list. At this time, the major exports from Queensland were products from the mining, pastoral and agricultural industries (Lewis 1973: 28-29). It is possible these kinds of goods made up that which was exported by E&A ships. The *SS Brisbane* also operated during the emergence of the frozen meat export trade to Europe, and it is possible the ice houses on board held Queensland meats bound for Europe (GR 1880). Regardless of what exact goods the E&A fleet exported from Queensland, it was certainly the competitive ocean going steamers rather than the large sailing ships that dominated the colony's transport trade (Bach 1976: 194).

In terms of the intra-State trade in Queensland, it is difficult to determine what specific goods were carried by E&A ships; nevertheless we can get a broad idea of the significance of the E&A service to the local economy of Queensland. Lewis and Bach suggest that a major reason for the Queensland mail contract was to promote competition and break the Australasian Steam Navigation Company's (ASN) monopoly of the Queensland coastal trade (Lewis 1973:42, Bach 1976: 194-5). This demonstrates that the company played a significant role in shaping regional trade.

Chinese immigration. The transport of Chinese immigrants to Australia was highly lucrative work for the E&A and it was certainly a significant part of the *SS Brisbane's* passenger trade. For example in October 1880, the *SS Brisbane* transported 242 Chinese passengers from Hong Kong to Australian ports (NTTG 6 November 1880). Furthermore, there were Chinese passengers aboard the ship when it struck Fish Reef in October 1881. In context to Northern Territory history Chinese immigration had a massive effect on social and economic life. Jones (1997: 112) states that in the year 1875, the first year the *SS Brisbane* was operational, the non-Aboriginal population of the Northern Territory was 742, 64% being European and 23% being Chinese. In 1881, the year the ship stranded, the population of the Northern Territory was 4,768, 14% being European and 86% being Chinese.

The *SS Brisbane* operated as a immigrant ship at a time when there were outbreaks of diseases such as smallpox in Australian ports. It was believed that these diseases were brought from Asia. The outbreaks also occurred at Port Darwin (Kettle 1991). Figure 4 depicts Chinese immigrants aboard the *SS Brisbane* being checked for signs of smallpox before they are allowed to disembark. The ship was moored at Port Darwin. The South Australian *Quarantine Act 1877* decreed that passengers could not disembark a steamer before a 21 day period following departure from an infected port. It was assumed that signs of infection would be evident in a medical examination following this incubation period (NTTG 21 Jan, 1888).

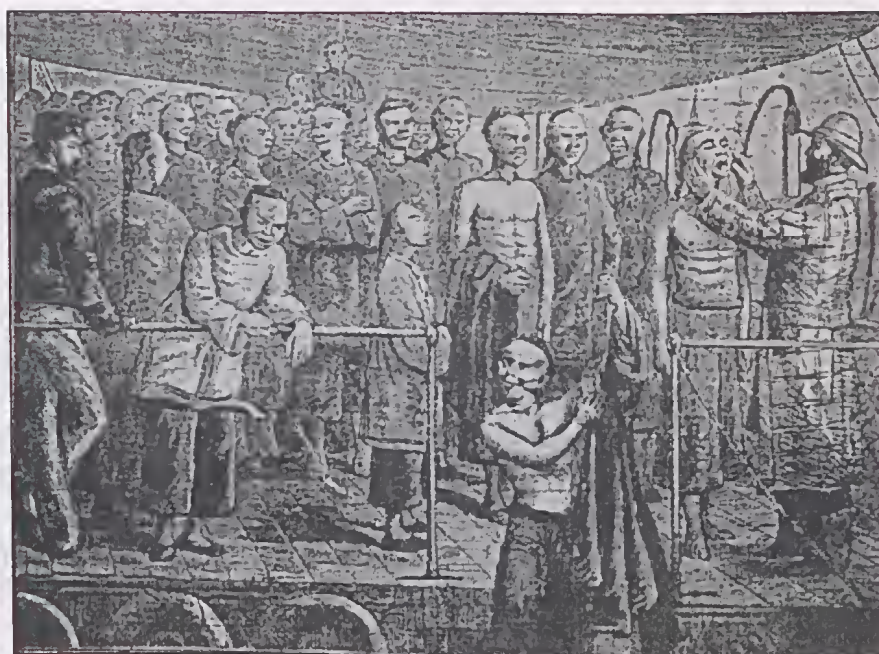


Fig. 4. Medical checks for smallpox aboard the *SS Brisbane*, anchored in Darwin Harbour (SMH 9 July 1881)

The *SS Brisbane* and Port Darwin trade. From the perspective of the company agenda, which focused on connecting eastern Australia to Asia and Europe via the Torres Strait, the significance of Port Darwin as a *port of call*, prior to the Port Darwin mail contract, appears minor. This does not mean, however, that this ship and the shipping company were not important to Port Darwin.

Prior to the Port Darwin mail contract, established in 1881, the E&A fleet visited Port Darwin only sporadically and the company handbook to passengers describes the northern settlement in negative terms (E&A 1875: 15). However a review of the shipping news, as depicted in the local newspaper, for the same year the handbook was published, demonstrates that the E&A ships were responsible for the majority of Port Darwin import and export activity (NTTG 1875). This means that despite the minor role the port played in the company history at this time, the ships of the fleet contributed significantly to the economic life of the Northern Territory and had played an important role in connecting this geographically isolated settlement with the rest of Australia and Asia.

Furthermore, by 1881, Port Darwin shipping activity had increased, suggesting that the port became more important over time. In the 1881-1882 financial year the total number of vessels that called at Port Darwin was an impressive 51, with 46 of these being steamships (GR 1882). In the same report, the Government Resident stated that ‘...the passenger and cargo trade has evidently been very profitable to the owners, as one of the Captains of the mail steamers informed me Port Darwin was their most profitable port of call’ (GR 1882:2). The contrast to this, is a broad economic picture which suggests that the Northern Territory was neither economically prosperous nor producing considerable export goods (Powell 1982: 106-107 & 138-143, Sowden 1882: 126, South Australian Royal Commission 1895). Therefore, what work were these steamships engaged in?

The steamship trade of the Northern Territory at this time was based on the importation of necessary goods and equipment and the transport of people to and from the Northern Territory. Focusing on passenger transport, as discussed earlier, the transport of Chinese immigrants was a considerable component. The amount of shipping work would have certainly fluctuated, for example peaking during mining booms with the arrival of miners and the transport of mining equipment. Yet despite these fluctuations there was certainly a steady growth of international and inter-colonial steamship activity around the operational history of the *SS Brisbane*. In 1875 Northern Territory advocates were unsuccessful in their attempt to persuade the E&A to divert steamships to the Northern Territory (NTTG 13 February 1875). By 1883 there were three shipping companies offering competing services (GR October 1883).

The significance of this is that prior to the growth of shipping activity the *SS Brisbane* was significant to Northern Territory history by providing an essential if occasional service transporting passengers and goods to Asia and eastern Australia. Later the *SS Brisbane* was amongst the small fleet of ships charged with providing a mail service for Port Darwin which also transported a considerable percentage of the Northern Territory's cargo and passenger trade.

Figure 5 shows the *SS Brisbane* moored at Fort Hill, Port Darwin in 1879. At this time, there was no suitable wharf to service the large steamships so they moored in the harbour, and goods and passengers were lightered in smaller ships. The lack of a suitable wharf facility was criticised by William Sowden (1882), a member of a South Australian parliamentary tour of 1882. He stated: '...[the steamships] cargo is lightered, and the transhipment from the ship to the store- a distance of 300 yards - costs fifteen shillings a ton. The goods are landed short of high water mark sometimes, and what with scarcity of drays, and tide and rain, considerable loss is incurred each year by importers' (Sowden 1882: 122).



Fig. 5. The *SS Brisbane* moored at Fort Hill, Darwin Harbour, 1879, Inspector Paul Foelsche.
Bob Noyle collection

3.2. The stranding of the *SS Brisbane* and the Marine Enquiry

The stranding event. It was a legislative requirement for a Marine Enquiry to be held following the loss of a ship. Excerpts of the proceedings were printed in the local newspaper and from this we have Captain Craig's own account (NTTG 29/10/1881).

He explains that on 9th October the ship was travelling south along the west coast of Bathurst Island. The officers sighted what they thought was Cape Fourcroy, situated on the SW point of Bathurst Island. It was later revealed that they sighted a reflection on the water. The course was altered based on that sighting.

They accidentally entered Port Patterson, north of Bynoe Harbour, and struck a reef off Quail Island. They anchored and waited for sunrise and the higher tide. At the time the Captain believed the ship had struck Bathurst Island.

On the morning of 10th October the ship floated on the high tide. The Captain took bearings from Quail Island and Point Charles in an effort to identify the ship location. He wrongly identified these visual marks and so again misjudged the ship's location. The vessel steamed north and soon struck Fish Reef, where it became permanently stranded.

The Captain and his officers argued that the navigation error occurred because the navigation chart showed the tide flow incorrectly, and because there was a lack of navigation markers in the area.

The enquiry decision supported the Captain declaring:

‘...we consider that the wreck was caused by the current and tide having set the vessel to the southward and westward, also through the bank of haze being mistaken for land and the ebb tide being wrongly marked on the chart as running east instead of to the west. The weather being hazy we do not consider the captain to blame for mistaking it for the land. The court considers that it is absolutely necessary that a beacon of at least 50 feet in height, or a lighthouse, be erected on Point Charles’ (NTTG 29 October 1881).

In April 1882, further government correspondence on the matter found conflict with both Captain Craig's explanation and the court findings, stating that what was defined as tide marks (incorrect tide marks) were in fact the track of a survey vessel (ICGR A5532). The result of this challenge is unknown.

3.3. Post-stranding events

Salvage and related auctions. News of the stranding first reached Port Darwin when Mr Wilson, third officer of the *SS Brisbane* reached the port on a ship's boat. That day Mr Brown, agent for the E&A company, Mr Cate of Customs and Captain Marsh, the Northern Territory Harbour master and Receiver of Wrecks, sailed to the stranded ship aboard the *Dawn* and the *Activity*. James Dunscombe, who would eventually purchase joint ownership of the wreck, owned these two lighters. Saloon passengers, their luggage and the mail were taken immediately (NTTG 15/10/1881).

Salvage of the cargo continued for a number of weeks. One Sydney newspaper excerpt refers to the southern port finally receiving some of their consignment with:

'Fifty-four cases of opium slightly damaged and about 1000 packages of tea in good order reached here from the wreck of the steamship Brisbane. It is thought she will hold together sufficiently long to allow more cargo to be let out' (SMH 26 October 1881 6C).

On 25 October 1881 a small auction of water damaged cargo was held, with goods such as tortoise shell ornaments, silks, embroidered shawls, jewellery and lacquered goods being sold (NTTG 29 October 1881).

By 29 October 1881, only 19 days after the stranding, hope of refloating the vessel was lost and it was handed over to Captain Marsh the Receiver of Wrecks (NTTG 29 October 1881). Salvage of the cargo continued and was extended to include ship fittings and equipment.

On 23 November 1881 an auction was held for the benefit of the insurance underwriters. In total £500 was raised. The wreck as it stood was sold for £50 to Dunscombe and Lamont, the lightermen hired to salvage the cargo and transport crew and passengers (NTTG 26 November 1881). They also brought the majority of salvaged goods and fittings. Items listed included marine goods such as blocks and tackle, the compass and sails. Other items included the ship's piano, tablecloths, maple sofas for the courthouse, rifles, blankets 'for the Aborigines' and sheets for the hospital (NTTG 26 November 1881).

SALE BY AUCTION.
 AT M. J. SOLOMON'S STORE, MITCHELL-STREET,
 On Wednesday, November 23rd, at 10 o'clock.
V. L. SOLOMON & CO.
 Have received instructions from Captain Marsh, Receiver of Wrecks, to sell by
 Public Auction, as above, on WEDNESDAY NEXT, at Ten o'clock,
WRECK OF THE S.S. "BRISBANE"
 As she now stands on Fish Reef.
 . ALSO:
**THE WHOLE OF THE SALVAGE, SHIP STORES, FITTINGS
 TACKLE, & C., CONSISTING OF**
 Table Linen, Bed Linen, Cutlery, Glassware, Platedware, Mattresses, Sofas
 Chairs, Mirrors, Tables, Cabin Fittings, Sails, Ropes,
 Bells, Compasses, Guns, Cannons,
 and Sundries
 too numerous to mention.
SALE AT TEN O'CLOCK SHARP.
TERMS CASH.

Fig. 6. Notification of 23 November 1881 auction (NTTG 19 November 1881)

The next day, on Thursday 24 November 1881, a second auction was held selling ship boats and 'copper piping'. The piping may have been a portion of the condenser. This auction raised over another £800 (NTTG 26 November 1881).

SALE BY AUCTION!
AT THE GULNARE WHARF.
On Thursday, November 24th, at 10 o'clock,
V. L. SOLOMON & CO.
Are instructed by Captain Marsh, to sell by Public Auction, as above, on
THURSDAY, November 24th, at Ten o'clock, at the Gulnare
Wharf, a Large Quantity of
COPPER PIPING.
ALSO:
SIX LARGE SHIP'S BOATS,
WITH THEIR FITTINGS, AS THEY LAY.
TERMS AT SALE.

Fig. 7. Notification of 24 November 1881 auction (NTTG 19 November 1881)

Dunscombe and Lamont continued salvaging fittings and wreckage from the stranded steamship for months following the auction. A fourth auction of goods consisted of some of these and was held on 22 December 1881. On 31 December 1881 the editor of the local newspaper suggested they would make £3000 from their £50 investment, however it disagreed with other speculation that the owners would make £20,000 (NTTG 31 December 1881).

AUCTION SALE.
AT ADCOCK BROS' STORE.
V. L. Solomon & Co.
Will sell by Public Auction, under instructions from Mr. V. V. Brown, on
THURSDAY
December 22nd, at Two o'clock,
A LARGE QUANTITY OF
SALVAGE GOODS
From the Wreck of the steamship *Brisbane*,
Consisting of—
TEA, RICE, MATTING, SCREENS,
CHINESE STORES, CURIOS, &c.
Noreserve. Terms cash. Sale at Two sharp

Fig. 8. Notification of 22 December 1881 auction (NTTG 17 December 1881)

Salvage continued and as late as April 1882 the local newspaper reported that:

‘One or two donkey engines which were too securely fastened for Messrs. Dunscombe and Lamont to get at before the north-west monsoon set in are now lying on the reef clear of the wreck and Captain Dunscome considers he can easily raise them. During the next few months of fine weather he will probably secure a large amount of valuable fittings’ (NTTG 29th April 1882).

As a final note regarding salvage, a popular history written by journalist Ernestine Hill in 1951 states that VV Brown (E&A agent) and son Alfred Brown ‘in a blackfellow’s canoe, brought the cash-box and ship’s papers from the wreck of the *SS Brisbane* in Bynoe Harbour...’ (Hill 1951:36). The account is clearly inaccurate given that such a dangerous and demanding exercise was unnecessary as commercial lighters were paid to salvage the vessel. However it signifies how the salvage story evolved to become an anecdote in popular Northern Territory legend.

Illegal salvage, loss of cargo and court proceedings The local newspaper also tells of a number of court proceedings related to the salvage of the ship. A ‘malay’ man named Jahannes, who was working aboard a salvage vessel was convicted of stealing silk handkerchiefs, decanters and table-clothes from the wreck (NTTG 19 November 1881). A ‘European’ man named George Norcock was charged with ‘illegal importation’ of cigars from the wreck (NTTG 19 November 1881). Civil proceedings were also taken against Captain Dunscombe who owned the *Dawn*. The *Dawn* sank while attempting to transport cargo, mostly food goods such as rum, rice and sugar to Southport, Darwin Harbour. A considerable portion of this cargo was salvaged cargo from the *SS Brisbane* wreck (NTTG 6 May 1882).

The *SS Brisbane* as a navigation marker For many years following the stranding of the *SS Brisbane* the lack of navigation markers along the coastline continued to make shipping dangerous. Passengers would hold formal presentations thanking the Captains for safe passage. In the case of the E&A ship *Tannadice*’s voyage to Port Darwin in August 1882, the chairperson of the proceedings was a passenger who was aboard the *SS Brisbane* when it stranded (NTTG 12/8/1882).

The threat of further navigation disasters in the Fish Reef, Port Patterson area was an ongoing concern, particularly because of the lack of navigation aids. In 1895 a navigation marker was placed literally on top of the protruding stern of the wreck of the *SS Brisbane* (NTGR 1895). An 1895 ‘notice to mariner’ stated it was visible from a radius of 3 miles (NTTG 8 November 1895). The image below depicts one design that was proposed for the Fish Reef beacon. It is unknown if this specific design was adopted.

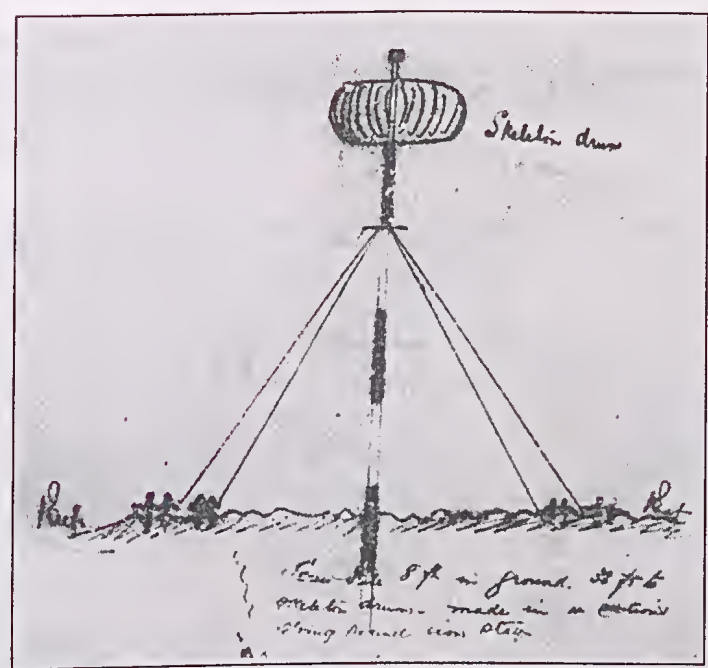


Fig. 9. Proposed Fish Reef beacon (ICGR 256/1897)

CHAPTER 4: SITE LOCATION AND ENVIRONMENT

4.1. Site location

The *SS Brisbane* shipwreck is located at: 12° 26.000 S 130° 26.300 E (WGS 84)

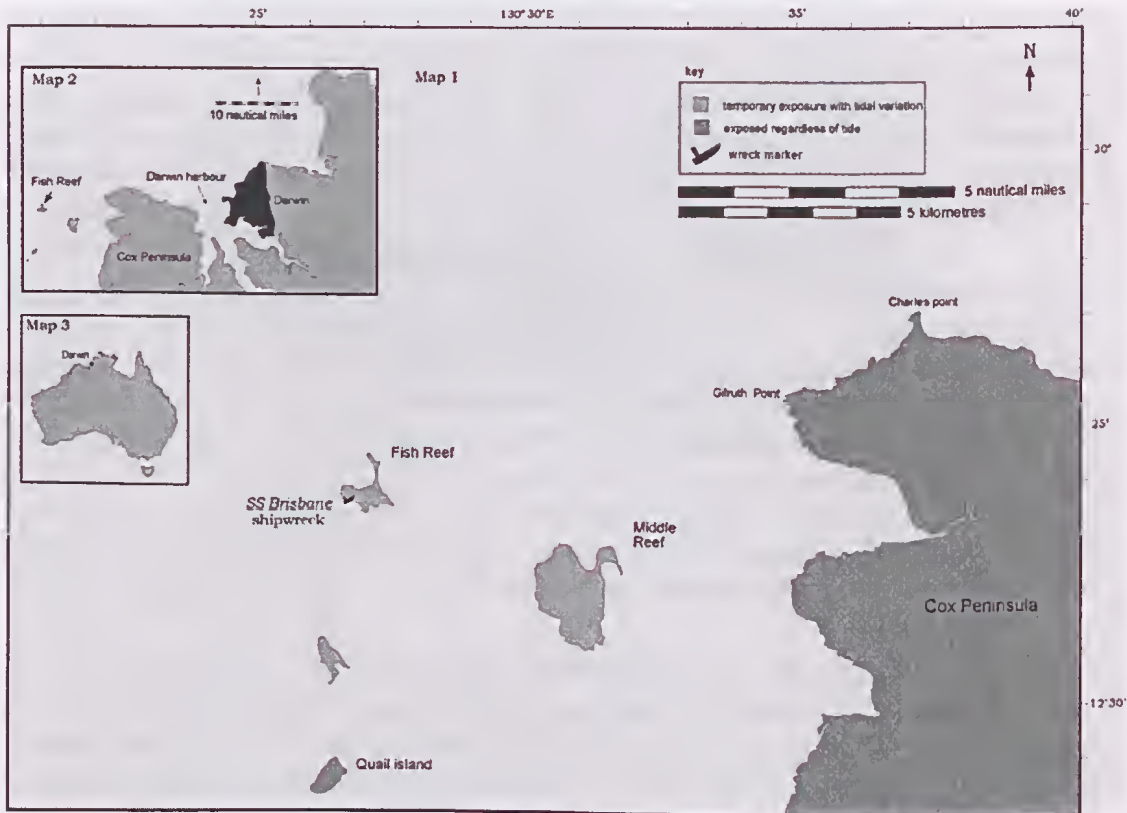


Fig.10. Site location

4.2. Fish Reef and surrounding waters

Fish Reef is located approximately 8 nautical miles west of Cox Peninsula and approximately 25 nautical miles west of Darwin Harbour. Cox Peninsula is a well-known natural landmark, and its eastern side forms the western shoreline of Darwin Harbour.

Immediately south-west of Cox Peninsula is an area of water known as Port Patterson. Port Patterson is formed by Cox Peninsula on its right and a chain of islands, and a stretch of land that is exposed at extreme low tide, on its left. Port Patterson is divided in half by an elongated island called Indian Island. The right branch of this division is known as Bynoe Harbour. Bynoe Harbour is a popular recreational fishing destination and it can be an entry point to Fish Reef for trailer boats.

Fish Reef is located north of the northern perimeter of Port Patterson (AUS 29). It is the northernmost reef in a chain of reefs and islands that extend approximately 13 nautical miles from the coastline (AUS 29). The closest island to Fish Reef is Quail Island which is located approximately 8 nautical miles in a southern direction.

Fish Reef is used mostly by [recreational] fishers operating small craft (Australian Pilot Volume 5:1972). Within Bynoe Harbour are areas leased for commercial pearling (Nautical Chart AUS 29). Located south and south-west of Fish Reef are areas of water zoned for military exercises (Nautical Chart AUS 29).

4.3. Fish Reef tidal exposure

The changing tide is a dominant characteristic of Fish Reef and when planning a visit to the shipwreck the tide should be carefully considered.

Fish Reef is a rocky reef that is partially exposed at extreme low tides. At high tide the reef and the shipwreck is completely covered by water. At this time the only feature marking the reef is the tall navigation beacon. At an extreme low tide, for example during a spring low tide, a portion of the reef and the shipwreck is exposed high and dry, and people can explore this higher plateau of the reef by foot.

The spring tide cycle occurs twice a month and is marked by a Full Moon or New Moon. It is the cycle that has the highest high tides and lowest low tides. The nautical chart indicates that during spring tide cycles Fish Reef can experience a tidal range of 6 metres (nautical chart AUS 29). The same reference stated that the maximum recorded tidal current in the area is 1.3 knots.

The result of this tidal pattern is that a portion of the shipwreck is continuously submerged in water regardless of the tide. This is the area below the inter-tidal zone. Another portion of the shipwreck is exposed at intervals. This wreckage is located on a higher reef plateau which can be described as an intertidal zone, even though the water only recedes at spring low tides.

The image below is an oblique view of Fish Reef taken at spring low tide. The image also shows some material from the wreck. It clearly demonstrates the degree of exposure that can be expected during this tidal phase.



Fig. 11. Oblique aerial photo of Fish Reef and exposed wreckage at low tide.
(Marine Branch, Transport and Works)

4.4. Salinity and water temperature

The water temperature ranges from 26°–29°C over the year (Aus Pilot Vol. 5:16). Average ocean surface level salinity ranges between 34.5–36‰ over the year. There are no major freshwater outlets in the vicinity of Fish Reef to affect salinity levels.

4.5. Seabed

The seafloor in the local area of the site consists of exposed bedrock, boulders and areas of fine-grained sand.

4.6. Fauna hazards

The chance of encountering a saltwater crocodile on the site exists, however it is not high because the site is some distance from estuaries and inlet systems. Sharks can frequent the area. Other dangerous fish that can be found in the Northern Territory are the stingray, stonefish, scorpion fish and catfish. The blue ringed octopus and box jellyfish are also present. Divers should avoid handling stinging hydroids, sponges, sea urchins and cone shells (Sutherland 1983; Last 1994; Cogger 1992).

CHAPTER 5: SITE DESCRIPTION

5.1. Introduction

This chapter is a description of the site and includes the survey results. Due to the high operational costs inherent in visiting this site only a portion of it has been surveyed and mapped. However a complete description of the site is offered.

5.2. Summary

The *SS Brisbane* shipwreck lies along a gradually ascending reef floor with the stern in deeper water than the forward section.

The stern to the midship section is located below the inter-tidal zone remaining submerged regardless of the tide. The superstructure and decks of the ship have collapsed and there is little of this material remaining on the site. Sections of the lower hull and ship floor remain visible, and though not continuous, these sections follow the original line of the vessel.

The stern section remains considerably intact but has broken away from the ship floor and fallen forward. A length of the propeller shaft and housing is still connected to the stern. The four bladed cast iron propeller, rudder and a portion of the stern steering mechanism is intact. The midship area can be identified by the presence of boilers, a tank and the remains of the condenser, which was a section of the propulsion engine. There is also a length of the stern mast and a smaller length of the foremast.

Historical reports state that the ship broke up with a list to starboard (right) and today the turn of the remaining lower hull demonstrates this. Along the starboard side of the remaining lower hull the list has brought the remaining hull to rest flat, close to the seafloor. In contrast the port (left) side stands taller with greater relief off the seabed. In places along this port side the hull plating is intact, and in other parts the hull plating is gone and the rib structure is uncovered. The list has also caused many features not part of the ship structure, such as boilers, to fall further starboard metres away from the ship's hull.

This stern and midship section of the shipwreck ends at a clear juncture. At this juncture, at the forward end of the midships, there is a sudden sharp elevation in the reef which is approximately 2 metres in height. This point marks the end of the ship floor and also marks the spring low tide line. It is likely that the ship once balanced over this rise and over time the hull broke its back at this point. This explains why the ship floor ends here.

On the higher plateau of the reef, in what can be described as the intertidal zone, are the remains of the forward section of the ship. In this area there are scattered portions of hull plating and what resembles a section of the ship floor. These are no longer in line with the original direction or line of the hull.

It can be summarised that in this area in which the forward section of the wreck is located, there is less hull integrity and material has been scattered, probably more than once, across the reef surface. An example of material being scattered is the re-

deposition of two tanks 400 metres away from their original location. The poor hull integrity and the scattering of material have been caused by direct exposure to wave and wind action. The affect of these forces would increase dramatically during the cyclone period. Also to a degree the absence of sand on this higher reef plateau would have promoted the distribution of material, because sand cover can reduce the affect of mechanical forces.

Although the cultural material in this section is greatly scattered there are exceptional examples of machinery and other features. This includes: a section of the bow; capstan; windlass; two winches; anchors; a mound of chain, two boilers and three storage tanks. Also scattered across the reef and trapped in crevices and pits, are ceramic pieces and coins which are popularly described as 'Chinese coins', identified by their size, colour, and distinctive square punctured from the middle.

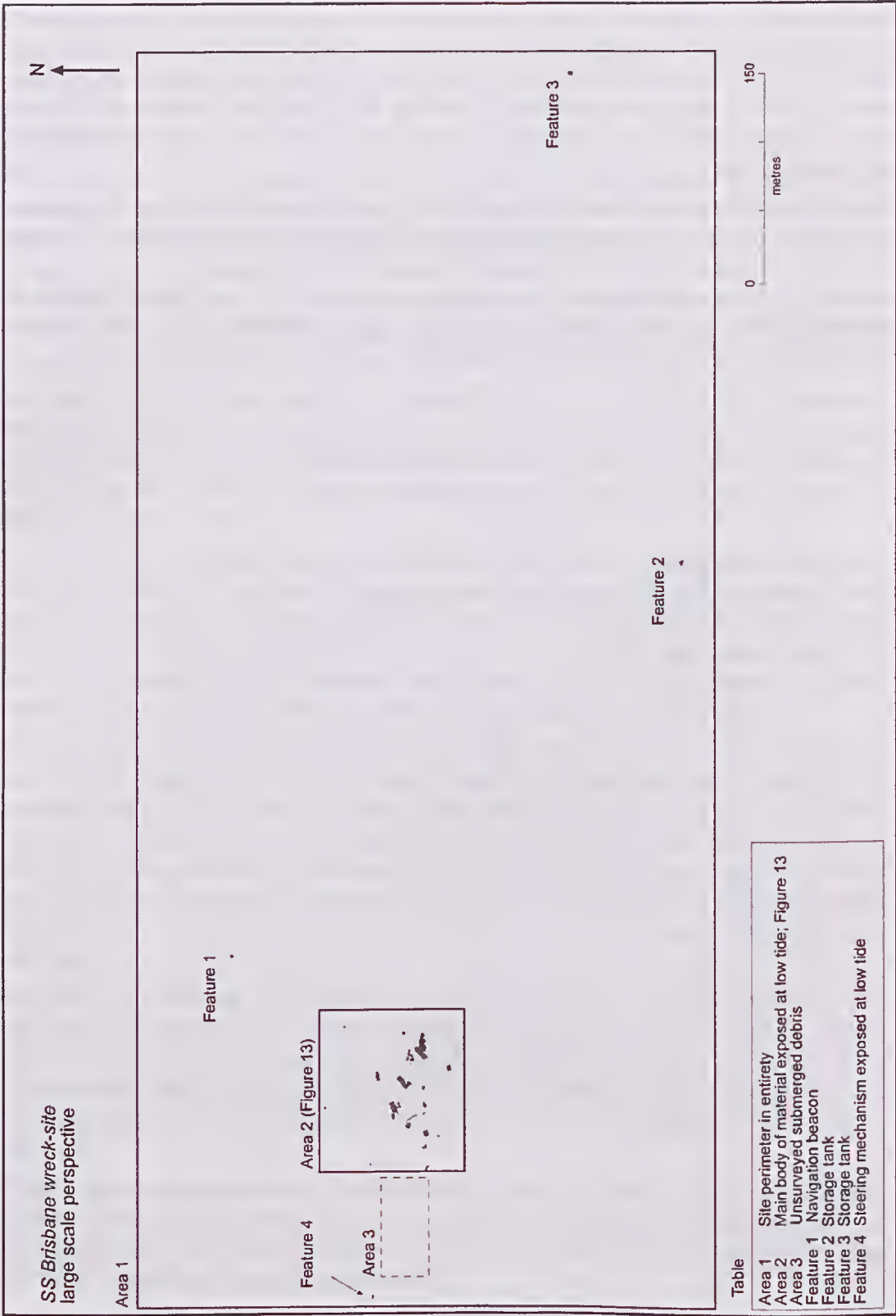


Fig. 12. Site plan 1



5.3. The bow and those features located in its vicinity

The bow. The section of curved bow is one of the most recognisable structural features of the wreck and it is located in the intertidal zone or what can be described as the higher plateau of the reef.

Visible signs give some idea of which part of the bow this section came from. The hawse is the large oval hole in the hull in which the chain for the forward anchors would feed through. The presence of this indicates that this portion of bow is from the forward upper area of the port side. There is however no evidence of the gunwale, indicating that this extreme upper level of the bow has been torn away. Confusingly the upper edge of this bow section has been torn into a shape that could be misconstrued as a turtle back. A turtle back is a crescent shaped feature of the forward sheer strake plating, or upper level of the bow. It is however not a turtle back, indicating that the upper level of the bow is not represented.

This portion of bow has retained its curved shape because of structural support offered by the underlying arrangement of horizontal deck beams and side stringers. This was arguably one of the strongest sections of hull when the ship was operational.

The distance between this section of the bow and the stern was measured and this indicated that the bow is within 5 metres of its original position from the stern. Therefore despite the lack of hull integrity and the scattering of some material by wind and wave action the bow still demonstrates close to its original distance from the stern. Therefore to some degree the bow and stern still represent the original length of the ship.

An observation of the wreck was made in 1881, the year it stranded, in which it was stated that the ship was tilted at an angle sufficient to make a length of the bow hang above the ground. Perhaps this section of bow viewed on the reef today constituted a part of the bow that hung above the reef. Eventually, under its own weight, the bow would have broken away from the keel of the ship and fallen to the ground.



Fig. 14. Bow (photo: D. Steinberg)

The keel or stem post. A long iron structure lies wedged into the bow section. It appears as two blade shaped lengths of sheeting joined together by a thick length of iron. It is either a section of the keel or stem post. It is more likely a portion of the keel, with both sides of the ship's outer hull still attached. There is not a keelson attached to this length of keel to support this argument. However it is less likely the stem post because a section of stem post attached to the bow is of a different thickness and width.



Fig. 15. Keel or stem post (photo: D. Steinberg)

A small winch, chain and a section of foremast. In close proximity to the bow is a group of mechanical and structural features.

Directly behind (west) of the bow structure is a winch, a large mound of chain and a short section of the foremast. Although they are in close proximity to each other the chain itself is not wound onto the spool of the winch. It is unlikely that this winch was used to haul this chain as the windlass was better suited for that work. The winch sits upside down. The chain is a solid mass fused together by corrosion. It was once stored inside a sub-deck forward chain locker, however there is no evidence of the locker fixed or corroded into this mass of chain. The section of mast must have been torn away from the rest of the foremast by a sudden physical action rather than slow progressive corrosion. It is unlikely that its present location demonstrates where the foremast originally collapsed.



Fig. 16. Winch and chain (with bow in background) (photo: S. Jung)

Davits and Capstan. Just forward (east) of the bow by a few metres are four boat davits and the capstan. Davits were the small hook-shaped cranes that were used to secure and lower the ship's boats and raise the anchors from the hawse to the deck. The capstan was a large spool which sat on the forward deck and guided the chain to and from the locker. The capstan's shaft has been broken along its length, however the heavier and stronger capstan spool still remains attached to the shaft.



Fig. 17. Capstan and davits (in foreground) (photo: S. Jung)

Also located close to the bow is a windlass, which, like the smaller sized winches, was a steam driven pulley. It can be recognised as a windlass because it is substantially larger than the two remaining winches and it has a length of chain which leads to a bower

anchor. Paasch (Paasch 1977:156) distinguishes a windlass from a winch by its role in heaving bower anchors. The windlass sits upside.



Fig. 18. Windlass (photo: D. Steinberg)

7.4. The main boiler and anchors

Main boiler. The most prominent and recognisable feature on the site is the large boiler located near the bow. This boiler is one of three remaining main boilers on the wreck-site. The fourth main boiler is absent. It measures 2.7 metres in length and 3.75 metres in width. The boiler is in a near upright position, which can be identified by the orientation of the furnaces. It sits perpendicular to the line of the vessel and does not sit on bearers.

The boiler has furnaces on one side only. There are two holes indicating two furnaces however neither the furnace doors nor the control valves are present. There is no evidence of the smoke house or furnace that was once attached to the top of the boiler. Brass stays still run in a horizontal direction through the inside of the boiler, their ends secured in place from the outside by visible nuts. The inside of the boiler can be seen through holes in the wall. The boiler is not welded together but consists of a series of riveted sheets.

This particular boiler had been moved over 20 metres from its original deposition by wind and wave action. The boiler has been rolled in an easterly direction, suggesting that it was extreme north-west monsoonal weather that moved it.



Fig. 19. Main boiler face (photo: D. Steinberg)

Figure 20 shows structural debris that is most likely the remains of deck flooring opposed to hull structure. The deck debris appears as iron sheets riveted to a framework of supportive beams. There are regular rectangular spaces which were either hatches through the floor or areas covered with teak decking.



Fig. 20. Main boiler and deck debris (photo: D. Steinberg)

Anchors. The ship survey data states that the ship was equipped with 7 anchors: 3 bowers, 2 streams and 2 ketches (RSR no. 188, Sydney: 30 June 1880, National Maritime Museum, Greenwich).

During the fieldwork two complete anchors and the shank of a third were located on the site. The complete anchors were an example of a bower anchor and the second was either a stream or ketch. A second large bower anchor was removed by the MAGNT in 1976.

Figure 21 shows the smaller of the two complete anchors, which is either a stream or ketch. Note that this anchor has a ring at the end of the stock but no chain connected. Also one end of the stock has been broken off and the other end twisted back.



Fig. 21. Stream or ketch anchor (photo: S. Jung)

The bower has a large fluke that is bolted to the shank. Along the length of the shank (on both sides) is a fish-shackle, used to secure the anchor on deck. The anchor has chain attached and this chain leads to the windlass. It is unclear whether the anchor was deliberately thrown overboard once the ship became stranded or if it fell as part of the bow breaking up.



Fig. 22. Larger bower anchor with davit (photo: S. Jung)



Fig. 23. The stock of a broken anchor (photo: S. Jung)

5.5. East of the bow

Deck, hull and structural debris. Forward of the bow and further onto the higher plateau of the reef are large sections of deck and hull structure.

Some of the hull sections show the internal rib structure face up. Other examples have the outer side exposed. A section of gunwale with a bollard and a portion of deck are also located in this area.



Fig. 24. Sections of hull east of the bow (photo: D. Steinberg)

Winch and donkey boiler. Lying on the reef in an easterly direction from the bow are a winch, donkey boiler and three storage tanks.

The image below shows the winch located east of the bow, and its position in relation to the navigation beacon. The winch is heavily encrusted with marine growth, unlike other features such as the boilers. The diagnostic features that identify this feature are the squat frame, the warping ends (spools), wheels and horizontal rods.



Fig. 25. Winch (photo: D. Steinberg)

The donkey boiler located south-east of the bow is shown below. Its outer plating has in places been torn away and so the two cylindrical chambers are visible for inspection. Neither furnace doors or control levers remain on this boiler.



Fig. 26. Donkey boiler (photo: D. Steinberg)

The engineer's certificate from a Lloyds survey (Engineer Certificate 28 September 1874, National Maritime Museum, Greenwich) stated that a donkey (secondary) boiler was located on deck and in the engine room. The engine room boiler remains at the mid-ship section, suggesting this boiler, located on the raised plateau of the reef, was the forward deck boiler. It was therefore likely used to power deck winches, which were in turn engaged in tasks such as hoisting sails and moving cargo.

Three storage tanks. Located west of the bow are three storage tanks, two of which are rectangular and the other wedge shaped.

One rectangle shaped tank is located approximately 50 metres east of the bow. The oval hatch door of the tank is absent and two inlet/outlet valves are located on the same side. The dimensions of this storage tank are 1.2 metres x 2.3 metres. It is partly buried, making it difficult to measure a height (or thickness).



Fig. 27. Storage tank (photo: D. Steinberg)

A second tank is located approximately 300 metres from the bow in a south-south-east direction. This tank is wedge shaped suggesting that it was built to fit into a wedge shaped cavity, for example the forward curvature of the bow. Interestingly, the top surface, as it lies on the reef, is made of three overlapping sheets. This may have been a technique to increase surface strength. The length of each of the perpendicular sides is 1.63 metres. The width (height) of the tank is 80 centimetres in length.



Fig. 28. Curved storage tank (photo: D. Steinberg)

A third storage tank is located over 400 metres away from the bow in a south-east direction. This tank is rectangle shaped and measures 1.96 metres x 2.30 metres x 0.83 metres. The larger tank surfaces consist of iron sheets fixed side by side, rather than in an overlapping style. Unlike the smaller rectangle shaped storage tank described earlier, the oval hatch is sealed shut.



Fig. 29. Larger storage tank with beacon in background (photo: S. Jung)

5.6. West (aft) of the bow to the low water mark

Between the remaining bow structure and the low tide mark is a length of reef in which the forward hull section was once located. Despite the anchors and some sections of hull plating, there is little remaining in this area. The plating that does exist certainly does not account for all of the plating that once made up the forward hull section. This suggests most of the material has been removed from this area.

It is logical that this section of the wreck, over the stern section, has been broken up and scattered, as this area of reef experiences the full force of breaking waves and strong north-west winds.

Figure 30 shows the greatest concentration of hull plating in this area.



Fig. 30. Hull debris aft of the bow

5.7. The low water mark to the stern

Figure 31 shows the water's edge at a spring low tide. A stock of an anchor and the rib structure of the lower port side are visible in the foreground. In the background the stern steering mechanism protrudes from the water. The anchor stock to the stern steering mechanism clearly marks a specific section of the shipwreck. This section constitutes what was the stern to the midships of the *SS Brisbane*. This wreckage is not only a separate section of the shipwreck, because it is located below the low tide mark and therefore only accessible through scuba diving. It is also useful to consider it separate because the degree of hull integrity here differs greatly to that seen in the rest of the site.

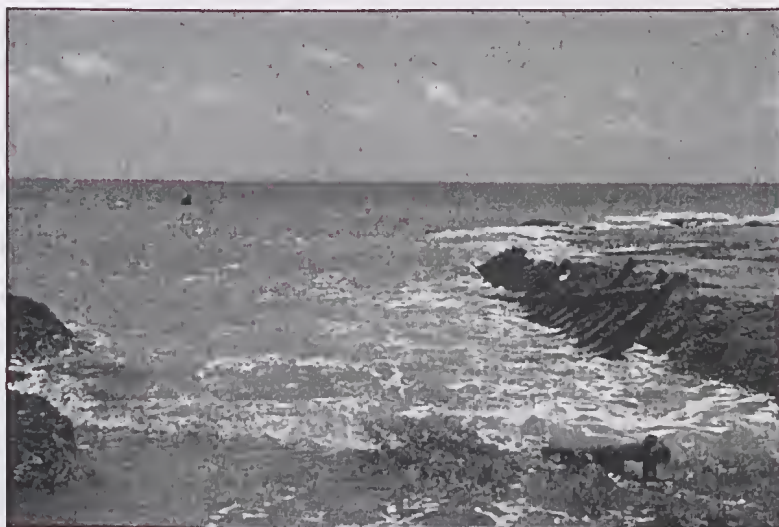


Fig. 31. Exposed ribs and stern steering mechanism (photo: S. Jung)

It is constructive to regard this section of the site as constituting three areas of wreckage. These are: the stern section, which remains relatively intact and has broken away from the ship floor; the remains of the ship floor and lower hull, which though broken follows the original line of the vessel; and finally, the wreckage that is located starboard of the ship's floor, which has fallen away from the ship's floor because of the wreck's original list to starboard.

The stern. The largest and most visually striking feature of the wreckage below the low tide mark is the stern. Figure 32 is a crude but useful guide to what constitutes the remaining stern section.

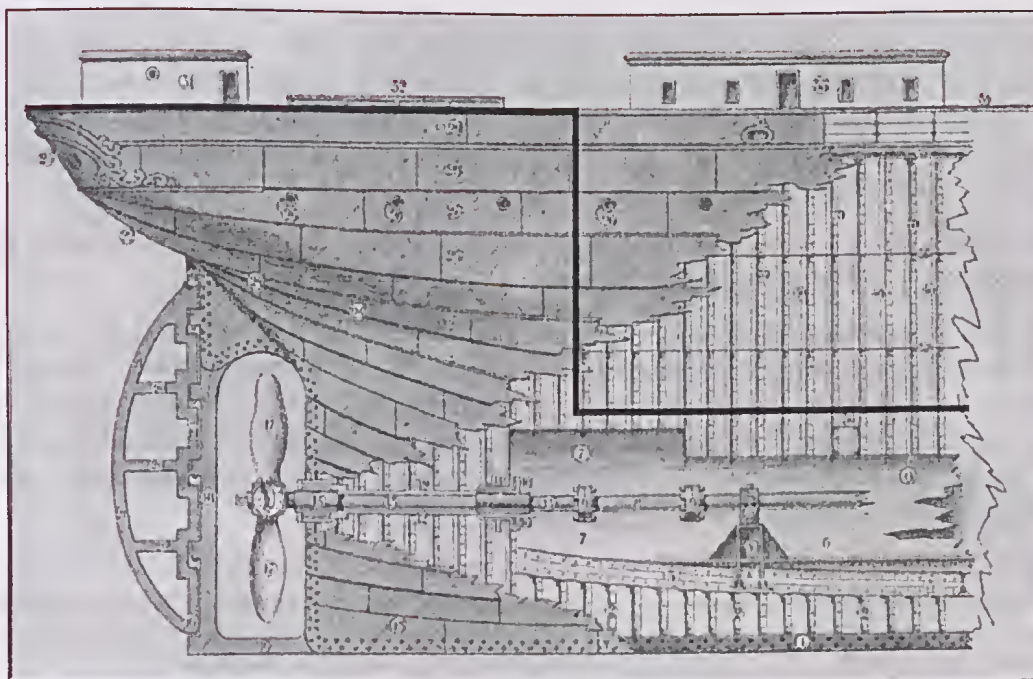


Fig. 32. Drawing outlining remaining stern (template from Paasch 1977)

As the drawing suggests, the propeller and rudder are still attached to the stern. The propeller is four bladed and made of iron. The rudder is turned to starboard. As demonstrated on the diagram, there is no stern wheelhouse on the wreck. The tallest feature of the stern is the stern steering mechanism, which is attached to the sternpost. The steering crank was once attached to an aft wheel, which was likely used only if the primary mechanism failed. Below the steering mechanism there are a few beams attached to the sternpost. These are likely remains of the transom structure. Figure 33 shows the stern steering mechanism.



Fig. 33. Steering mechanism attached to stern post (photo: P. Clark, 1990)

The stern appears to have broken away from the hull just forward of a bulkhead. The walls of the stern are intact from the deck to the keel. The stern's surface has both areas covered by iron deck and areas without deck, the latter allowing the inner workings of the stern to be seen. This is the far rear section of the stern and so the space within the stern is small and tapered. Protruding from the forward end of the stern is a length of the propeller housing and shaft.

The entire stern section has a list to starboard, and it has fallen forward by approximately 45° from its original orientation.

The ship's floor and lower hull. From the low tide mark to the beginning of the stern section lie the remains of the ship's floor and lower hull. As stated earlier, the ship's floor is not unbroken but it follows the original line of the ship. In some places the ship's floor is difficult to distinguish from the reef's encroaching surface. In other places the ship floor is clearly visible, and specific features such as the keelson and side stringers can be identified.

The ship's floor and lower hull still demonstrate the wreck's list to starboard that occurred following the failed rescue of the ship in the weeks following the stranding. As expected with a list to starboard, the port side of the hull is taller and curves slightly over the ship's floor. In some places the hull plating is intact. In others, the plating is

gone and the ribs are exposed. The starboard side of the lower hull is flatter and sits close to the seabed.

The third section of the shipwreck is the material that has fallen starboard of the ship floor and includes both machinery and structural debris. This phenomenon has occurred because this list to starboard continued as the ship broke up. This section includes a second intact main boiler, a third main boiler with exposed inner workings, the remains of a smaller boiler, a bundle of condenser pipes, a storage tank and a length of the stern mast. The main boiler with exposed inner workings was damaged in a salvage operation.

5.8. Ceramics and coins in-situ

Scattered across the surface of the reef and trapped in gullies and pits are ‘Chinese coins’ and broken pieces of ceramic. The coins are small round copper alloy coins with a square punctured in the middle. There are also broken ceramic shards, some with enough surface area to display motifs and artistic patterns.

CHAPTER 6: NATURAL FORCES AND SITE FORMATION

It is recommended that readers review the previous chapter dealing with site description prior to reading this chapter.

6.1 Deposition

The *SS Brisbane* shipwreck ran aground on Fish Reef on the 10th of October 1881. It ran forward onto the reef and remained upright. The reef has a large raised plateau, which is exposed at spring low tide. In the area of the shipwreck the edge of this raised plateau is marked by a series of rocky terraces. Beyond the terraces the water is deeper and it continues to descend at a gradual slope.

The ship moved forward onto the reef, eventually grounding with the midships resting on these rocky terraces. A failed attempt to reverse off the reef brought the ship 50 feet (15.24 m) into deeper water. The ship stayed in this location and developed a 25° list to starboard (NTTG 29th October 1881).

With the reverse of 15.24 metres, the forward section of the ship now lay on the rocky terraces. Historical accounts describe that at this time the ship's hull did not touch the reef floor for 10 feet (3 m) aft of the stem post. (NTTG 29 October 1881). This meant the bow was raised off the reef floor. Furthermore, a forward part rested on the rocky terraces with a part of its keel off the seabed.

Both the elevated bow, and the space between the ship's keel and the reef floor at the terrace, would have placed considerable strain on the hull. These would eventually work together to snap the keel of the ship.

6.2 Post deposition

Introduction. The forward portion of the wreck, opposite the midship to stern section, experiences considerably different environments and this has resulted in a different level of wreck integrity and appearance. The forward section is located on a raised reef plateau. This plateau has no sand cover. It is periodically exposed at spring low tide and is exposed to wind, wave and surge action. Fish Reef is not in sheltered waters and the shipwreck is located on its western edge, which means this part of the reef offers no protection from the extreme NW monsoon. A recorded visit to the site in April 1882 described how the first monsoon season since the stranding had considerably broken up the ship (NTTG 29th April 1882).

The midship to stern section is located in shallow water ranging from approximately 2-12 metres of water. The difference in depth is due both to the tide and a gradual slope in the reef floor. This section is also buffeted by surge and tide, however, to some degree, it is more protected from the weather than the material on the higher reef plateau.

The original length of the ship was 281.5 feet (85.80 m), and now the wreck site is over 400 metres wide.

The forward section. Though the forward section of the shipwreck is considerably broken up, the bow, windlass and mound of chain give some idea of how the ship collapsed and formed the site that is visible today.

A distance measurement from the bow to the stern indicates that the bow is within 5 metres of its original location. The mound of chain also suggests this. The chain was once stored in a forward chain locker close to the bow and it is most likely that the chain has not been moved by natural forces because of its weight and density.

The bow underwent a process of collapse and separation from the keel of the ship. The ship had a list to starboard and the bow continued to collapse onto its starboard side. Today the bow sits completely on its starboard side. As the bow collapsed, machinery that was attached to the deck of the bow separated from the bow and fell to the reef floor. The location of the windlass, capstan and davits show a pattern of distribution. As the bow collapsed onto its starboard side, deck features fell to the right of the bow. The windlass sits upside down and attached to its legs are torn sections of the deck. It is likely the windlass fell away from the bow under its own weight and landed upside down.

Forward of the bow are a winch, boiler and series of storage tanks. One tank, and the winch and boiler, are within a 20 metre radius of the bow. The winch most definitely came from the forward deck. The other material may have come from within the hull. As the forward hull broke up, material was scattered across the reef. Two other tanks are located over 400 metres away from the bow in a south-west direction. This is further away from the stern rather than back towards it. These tanks were dragged across the reef by strong north-west monsoonal winds, wave and surge. Located close to the bow is a large boiler, one of what was once four main boilers located amidships and used to power the propulsion engine. This boiler has been moved over 20 metres up an incline in the reef from its original location. The boiler was most likely moved by weather from the midships when the wreck was less broken up, and wreckage worked as a bridge to the higher reef plateau’.

Stern and midships. The stern and midships are located below the intertidal zone in approximately 2-12 metres of water.

The superstructure and upper hull of the wreck have been torn away from the remaining lower hull and ship floor. There is some debris around the ship floor but it does not account for this amount of structure. Therefore much of the wreck has been moved away. What remains is the lower hull, ship floor and the stern section.

The stern has separated from the ship as the hull walls broke down, making the stern less stable. The stern has fallen forward and with a list to starboard.

The walls of the hull have broken away, with the starboard side considerably more than the port side. This is because of the shipwreck’s list to starboard. Spread out to the right of the line of the wreck is material that rolled away from the ship as it broke up. Included are two of the main boilers..

The midship section of the ship ends abruptly at the steep rocky terraces. The ship floor and keel have now broken down to the reef floor but in the past the keel would have held the ship up onto the terrace, and there would have been a space between the keel

and reef floor. This was the juncture along the keel where the bow broke away from the ship.

A final observation regarding site formation is that the wreckage located below the intertidal zone is becoming incorporated into the reef. The surface of a lot of material is covered in marine growth and the iron surface has a layer of concretion. This process will continue.

Figure 34 is a series of drawings depicting major stages in the formation of the site. The most revealing aspects of the drawing is to appreciate the reef topography and the tidal range. The diagram is not to scale.

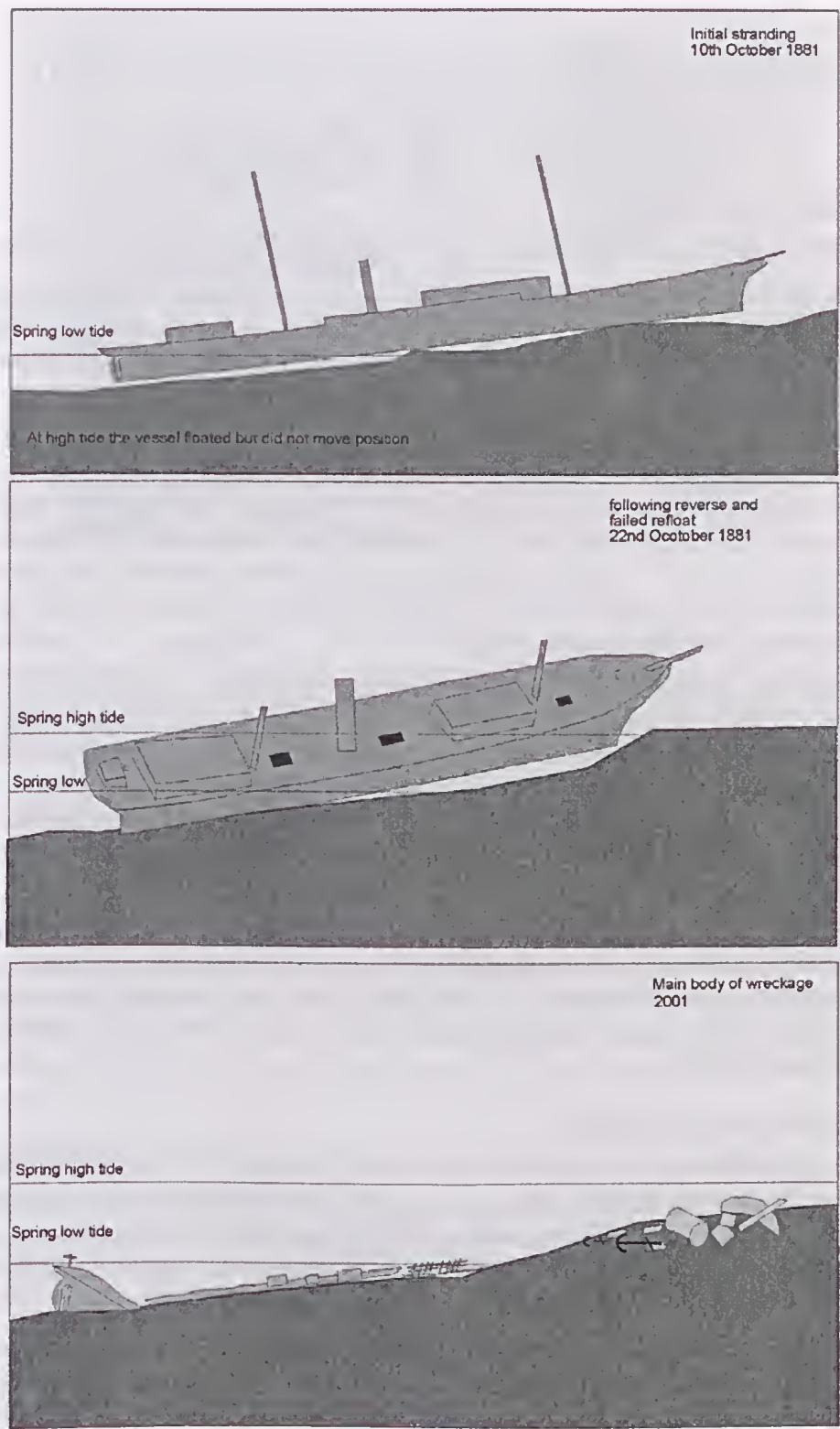


Fig. 34. Site Formation Sequence

CHAPTER 7. CULTURAL FACTORS INFLUENCING SITE FORMATION, AND RAISED RELICS

7.1. Salvage of the wreck

This shipwreck has undergone salvage from the day after its stranding to the present.

Historical accounts describe the initial salvage process as organised and thorough. At this time, salvors were focused on the removal of expensive fittings, equipment and cargo. Therefore, though the ship was equipped with fine furnishings and the personal belongings of over 100 people, little of this material remains on the site today.

In more recent years the *SS Brisbane* shipwreck has been salvaged by recreational scuba divers. In speaking to local divers over the course of this project I have learnt that the *SS Brisbane* shipwreck has been visited by local recreational divers since the 1950s and over the years many divers have collected material from the wreck. Some divers have conducted opportunistic salvage in which they take ‘valuable’ material if they happen to see it. Other divers have gone to the site with the specific intention of salvage. In these cases the damage has been more extensive.

One example of a planned and considered salvage operation was carried out by one salvor in the 1970s. An inspection of the main boiler located at the midships shows that a part of its outer shell has been blown away and most of the brass inner tubes removed. Local divers George Tyres and Rob Williamson (pers. comm. 2002) suggest this was likely done by a particular local diver in the 1970s, now deceased. George Tyres suggested that for some time this salvor focused on this site and overall he removed approximately 2 tons of copper alloy. This was sold as scrap metal.

Another example of a planned and considered salvage operation was that carried out by a specific dive group in the 1980s (MAGNT shipwreck files). In this case divers used a water dredge to excavate beneath the hull plating at the stern section. It was reported that a large section of wood was pulled away and the divers found a number of relics which they salvaged.

7.2. Relics in private collections

There is not sufficient information to estimate accurately how many relics from the *SS Brisbane* shipwreck are now held in private collections. What can be clearly stated is that there is an unknown number of relics from this shipwreck in the possession of a variety of people. None of these relics were registered during the 1993 National Amnesty and so they are held illegally.

The image below shows a selection of relics that may be from the *SS Brisbane* shipwreck. These relics, and others, have been collected by recreational divers over the years and are stored in a specific dive clubhouse (MAGNT shipwreck file). Though some relics have remained in the clubhouse, many members store material elsewhere. Therefore what exists at this clubhouse is only a sample of what has been collected by members.



Fig. 35. Salvaged relics

The members are unsure which relics in the picture are specifically from the *SS Brisbane* shipwreck. The ‘Chinese coins’ pictured in the photograph are likely from the site. Also all ceramics that are known to have been salvaged from a shipwreck, and can be identified as late 19th century, are likely from the *SS Brisbane* shipwreck.

Objects held in private collections and which the author has personally seen are brass pipes, a brick, a brush, a piece of glass from a porthole, coins and ceramic, some of the latter with surface area that displays specific artistic motifs (MAGNT shipwreck files).

Furthermore there are stories of people who, over the years, had salvaged portholes, more coins and unbroken examples of ceramic such as a tear-shaped glass bottle. There is also a story of small wooden blocks being salvaged, the suggestion being these were part of a board game. There is also a record in the MAGNT shipwreck file of a salvor/diver who removed coal and used it on a barbeque. The author has not seen this material in person, however most of these stories have been supported by more than one individual.

7.3. The MAGNT collection

The MAGNT has five objects in its collection from the site, not counting that material collected in 2000 as part of this project. These are a brass lock, a ship’s bell, a jar lid, three wooden shoes and a large bower anchor. These items, except for the anchor, were donated by members of the public. The anchor was salvaged by the MAGNT in 1976.



Fig. 36. Bell



Fig. 37. Raised anchor; May 1976 (*Fiji Times* May 1976)

CHAPTER 8: ASSESSEMENT OF THE SITE'S SIGNIFICANCE

8.1 Preamble

This chapter includes:

- An assessment of the site against an agreed criteria;
- An evaluation of the sites significance in terms of rarity and representativeness; and
- The Statement of significance, which summarises the assessment

The sources used to develop the framework and criteria for this assessment are the Burra Charter (Burra Charter 1999) and the Guidelines for the Management of Australia's shipwrecks (AIMA 1994).

Under each criterion the assessment ends with a brief statement as to whether under that specific criterion the site is of high, medium or low significance. These grades do not refer to an established ranking, but are only meant as a simple guide for the reader.

8.2 Historical significance

Significant in the evolution and pattern of history. Important in relation to a figure, event, phase or activity of historic influence (AIMA 1994:22).

The *SS Brisbane* was a ship that played a significant role in the expansion of the Torres Strait into a viable commercial passage between Asia and eastern Australia. The fleet of the Eastern and Australian Mail Steam Company worked one of the first ongoing services between Asia and eastern Australia through this passage. Their service also facilitated trade with Europe by connecting with other services once in Asia. The north Queensland coast and the Torres Strait was poorly charted at this time and so the development of this route did not just advance trade and communication, but also promoted the sounding and charting of an important part of the Australian coastline. Symbolic of its pioneering history, the *SS Brisbane* is reputed as being the first ocean-going ship to call at Thursday island.

The *SS Brisbane* also brought immigrants to Australia, predominantly Chinese immigrants. Over its working life the ship transported hundreds of Chinese immigrants to and from Australia and so played a considerable role in the history of Chinese immigration to Australia.

In context to Northern Territory history the *SS Brisbane* first visited Port Darwin when there was financial incentive to do so, and then was contracted to do so as part of a mail service. Over its working life the ship contributed in connecting this isolated settlement with Asia and Australia. As a mail steamer the ship was directly responsible for providing a communication service for the residents of the Northern Territory with the outside world.

The *SS Brisbane* shipwreck is of high historical significance.

8.3 Archaeological significance

‘The scientific or research value of a place [archaeological] will depend upon the importance of the data involved on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information’ (Burra Charter 1999: 2.4).

The *SS Brisbane* shipwreck is considerably broken up and much of the cargo, the belongings of passengers and crew and the ship fittings and furnishings were salvaged in the months following its stranding. Therefore the site is limited in its ability to contribute to archaeological research investigating themes such as conditions aboard, ship design, personal belongings or cargo.

However over the years divers have collected examples of ceramics, glass, and coins and it is likely examples of these still exist on the site. Also as part of this project the MAGNT collected 11 ceramics shards, in which some have sufficient surface area to reveal motifs and patterns. Furthermore the MAGNT has within its collection a small number of items including wooden shoes and a ship’s bell. Therefore though the body of material that exists is far from complete, it does offer an opportunity for a material culture study. The ship was heading to Australia from Asia and so examples of ceramics may represent imported goods or the belongings of Chinese immigrants.

The shipwreck is considerably broken up and the propulsion engine has not been located on the site. Therefore the site is limited to how it can contribute to the research of late 19th century steamship design. However in its favour there are examples of secondary machinery such as boilers, winches, a windlass, anchors and water tanks. Though this is an incomplete inventory of the secondary machinery that was aboard, they could contribute to a study in maritime technology. The *SS Brisbane* was built during a dynamic time in steamship engineering and its technology represents a specific stage in this evolution.

The *SS Brisbane* shipwreck is of medium archaeological significance.

8.4 Social significance

‘Concerned with a community’s regard or esteem’ (AIMA 1994: 23).

The Chinese community of the Northern Territory, as represented by the Chung Wah Society of the Northern Territory, considers the *SS Brisbane* shipwreck of specific significance to them because of the potential for research to contribute to knowledge about Chinese immigration to the Northern Territory. The site is not considered significant for religious or spiritual reasons.

Further research may discover that contemporary Australians had relatives who immigrated to Australia on the *SS Brisbane*. It is difficult to identify Chinese passengers as they were rarely individually named in sources such as the local shipping news. However research has demonstrated that other documents, such as naturalisation papers, identify passengers. To date two Chinese immigrants who arrived on the *SS Brisbane* have been identified (MAGNT shipwreck files).

The *SS Brisbane* is of medium social significance.

8.5. Educational and Recreational significance

‘Significant for its potential to contribute towards public education. Important for its potential for public education through on-site (or other) interpretation’ (AIMA 1994:25).

The *SS Brisbane* was engaged in a wide range of trade and for this reason it connects with many historical themes of the Northern Territory. For example it was an immigrant ship, a mail steamer that provided a communication service, and it facilitated cargo and passenger transport between the Northern Territory, Asia and other parts of Australia. This is not a shipwreck with a history which is narrow, and therefore of interest to only a few. The implication of this is that it has considerable significance as an educational tool in exploring many historical themes.

As a historic site that can be visited by the public, the *SS Brisbane* shipwreck is considerably rare and significant. It gains this status firstly because there are few located 19th century shipwrecks in the Northern Territory, and so it is unique in its ability to reveal or demonstrate this period. Furthermore the site offers various levels of access. The public can explore the wreckage through scuba diving, using snorkel gear or by foot at extreme low tide. This means the site is a potential educational tool for a wide range of people and the possibilities in terms of on-site interpretation are considerable.

Visitors can explore a wide range of secondary machinery and so the educational value of the material remains is high. The aesthetic value of the site is also considerable and this contributes to the visitor experience. The submerged wreckage, which can be explored by divers and those using snorkel gear is visually striking, particularly the stern with the large propeller and rudder. The abundant fish life on the site and the marine growth on the wreck’s substrate add to this aesthetic value.

The *SS Brisbane* shipwreck is of high educational and recreational significance.

8.9 Degree of Significance; rarity

‘Concerned with the uncommon or exceptional. (AIMA 1994:26).

To a considerable degree the *SS Brisbane* shipwreck is a rare historic shipwreck. It is one of only a few historic shipwrecks that date to the late 19th century that have been located in the Northern Territory. It is also rare because it is the only recorded historic shipwreck in the Northern Territory that was wrecked while bringing Chinese immigrants to the Northern Territory.

The *SS Brisbane* shipwreck is of medium rarity.

8.10 Degree of Significance; representativeness

‘Significant in demonstrating the characteristics of a class of cultural items’ (AIMA 1994:26).

The *SS Brisbane* is considerably broken up and parts of the ship’s structure and its contents have been removed from the site by natural forces and salvage. Therefore the shipwreck is not representative of a complete class or record of cultural items.

The *SS Brisbane* shipwreck is of poor representative significance.

8.11. Statement of Significance

Built by Inglis of Scotland in 1874 and commissioned by the Eastern and Australian Mail Steam Company, *SS Brisbane* steamship, joined a fleet of ships that became pioneers in the development of the Torres Strait passage between Asia and eastern Australia.

As an immigrant ship the *SS Brisbane* brought hundreds of Chinese immigrants to Australia. It provided a passenger and cargo service for the Northern Territory connecting it with Asia and other ports in Australia, and in later years it delivered the northern settlement's mail.

It is one of only a very few 19th century shipwrecks that have been located and identified in the Northern Territory, and it is the only recorded shipwreck in the Northern Territory that was wrecked whilst bringing Chinese immigrants to Australia.

The wreck is considerably broken up and a good deal of material has been removed by natural forces and salvage, therefore the site does not offer a complete collection of cultural items. Regardless there are items, such as ceramic shards, that could perhaps contribute to a material culture study of imported goods from Asia or the belongings of Chinese immigrants. Though the wreck provides only an incomplete inventory of the secondary machinery that was aboard, what does exist can contribute to a study in maritime technology. The *SS Brisbane* was built during a dynamic time in steamship engineering and the technical remains represent a specific stage in this evolution.

In terms of visitors to the site the shipwreck is an exceptional educational resource because in the context to the Northern Territory it is rare in its ability to represent a late 19th century shipwreck. Furthermore the site offers various levels of access, providing an experience for scuba divers, those swimming with snorkel gear and those who choose to explore wreckage and machinery on foot during extreme low tides. The ability to provide a variety of access options opens up visitation to the wider community, and the possibilities in terms of on-site interpretation are considerable.

The shipwreck is of social significance to the Chinese community of the Northern Territory, as represented by the Chung Wah Society, for its association with Chinese immigration.

CHAPTER 9: MANAGEMENT POLICY AND ISSUES

9.1. Preamble

The chapter outlines the management issues and policies relevant to this site.

The role of the policies are:

- to translate statutory requirements;
- to meet professional standards in the management of historic shipwrecks; and
- to provide a framework to guide future management concerns.

9.2. Legal Protection

Policy: ‘Complementary State and Territory legislation should be drafted to protect, document and manage shipwrecks, sites and artefacts not covered by the Commonwealth Act and general State or Territory heritage legislation’ (AIMA 1994:15).

Issues: The *SS Brisbane* shipwreck is protected under the Commonwealth's *Historic Shipwrecks Act 1976*. It is therefore unnecessary that this site be protected under complementary legislation.

Under the *Historic Shipwrecks Act 1976* it is illegal to interfere with, damage or remove an historic shipwreck or related items. The site became protected under this legislation in 1993, following an amendment in that year which automatically protects all shipwrecks older than 75 years and located in Commonwealth waters.

The site is also protected under the *Navigations Act 1912*, which is applicable to all shipwrecks in Commonwealth waters. Part 7 of this legislation states a person must give notice to the Receiver of Wrecks if they find or take possession of a shipwreck. The Receiver of Wrecks (Australian Maritime Safety Authority) has no record of an application to salvage any portion of the *SS Brisbane* shipwreck.

9.3. Public access

Policy: An adequate policy relating to public access, which does not result in threats to the shipwreck, is offered by AIMA (AIMA 1994).

‘Any person should be able to freely inspect, study, explore, photograph, measure, record or otherwise use and enjoy an historic shipwreck in State or Commonwealth waters if the activity does not remove the shipwreck or disturb it and its immediate environment’ (AIMA 1994:36).

Recreational diving. The author met with individual divers, members of dive clubs and dive shop operators to record a history of scuba diving on the site and get an idea of visitation numbers and what divers do when they visit (MAGNT shipwreck files).

Recreational scuba divers have been visiting the *SS Brisbane* shipwreck since the late 1950s.

Visitation is infrequent. The reasons for this are many. The site is approximately 25 nautical miles from Darwin Harbour and far from the coast. This restricts the use of smaller boats, and requires a considerable commitment of time and funds. Furthermore the site is located in unsheltered waters and boat operators can experience high wave and surge. Over the years boat operators have abandoned attempts to reach the wreck. Additionally dive conditions can vary. Tidal current can be strong. Also the tide can bring muddy silty water from the reef and coast across the shipwreck, reducing visibility considerably. With all of these considerations in mind, visitors only visit the site when the forecast and tide charts expect excellent weather and dive conditions.

The clubs and businesses listed below were contacted in 2001 and asked how often they visited the site and how many divers they took on each trip. The vast majority of recreational scuba divers diving in the vicinity of Darwin do so through one of these clubs or businesses, therefore their answers offer an accurate measurement of diver numbers.

Table.1. Visitation to the *SS Brisbane* shipwreck

Club/Businesses	Visits per year	Divers per trip
Cullen Bay Dive (business)	2 or 3 times	6-8 divers
Coral Divers (business)	Once in the last 3 years	8 divers
Sub-aqua club	twice	8 divers
RAAF dive club	Never been	

Some local recreational divers, who have dived the same shipwrecks in Darwin Harbour many times over, have never visited the *SS Brisbane* shipwreck or have done so only once or twice. In their case the shipwreck is a novelty. Other divers have dived the site many times over the years and have developed a good knowledge of it. The image below was produced by Phil Franklin, a recreational diver and member of the Sub-aqua Club. It depicts the portion of the shipwreck located below the intertidal zone.

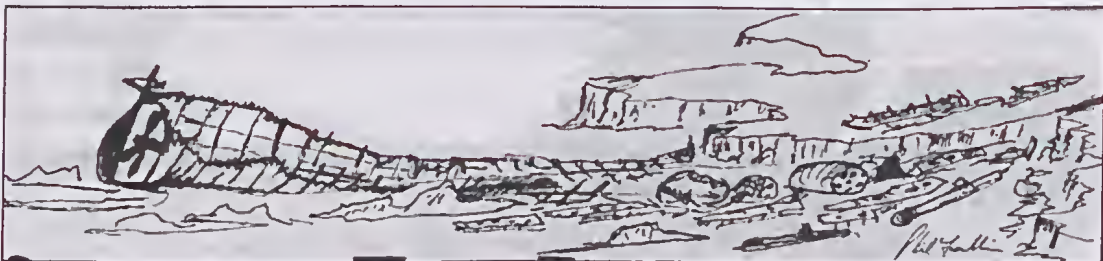


Fig. 38. Phil Franklin's artistic impression of the shipwreck

Recreational fishing. The *SS Brisbane* shipwreck is visited by recreational anglers.

There is no available information that can indicate how many anglers or fishing boats visit the site annually. Recreational fishing is a very popular sport in the Northern Territory and the shipwreck has a reputation as a fishing site. However the reef is some distance from the coast and so this must deter some anglers and reduce the overall number of visitors.

The shipwreck is advertised as a fishing site in at least two publications, a government publication called Darwin's Artificial Reefs (Department of Primary Industry and Fisheries: no date) and the *Fish Finder* magazine (1999, 2000). Both publications offer accurate position fixes for the site but neither refers to its heritage protection. The government publication may have been produced prior to 1993, the year that the site became protected.

The *Fish Finder* magazine suggests that Fish Reef 'produces big snapper and jewfish, mostly at night, and is a good reef to troll past for queen fish, trevally and mackerel, (*Fish Finder* 2 2000: 42). This gives a limited insight into the behaviour of visiting anglers. They would either anchor over the shipwreck or troll. The equipment used are likely handlines and general-purpose rods (www.nt.gov.au/dbird/dpif/fisheries).



Fig. 39. Recreational anglers trolling close to the shipwreck site (photo: D. Steinberg)

As a general principle, all anglers who visit the site should be aware of the site's protected status. This is because all visitors should know this, and because visitors may do a range of activities on the site including fishing, recreational diving or exploring the dry reef on foot. Therefore informing people through resources aimed at recreational anglers can educate people who may carry out a range of activities on the site.

During the project the author contacted the editor of the *Fish Finder* magazine and informed him of the protected status of the *SS Brisbane* shipwreck. It was requested that this be noted in future publications. The author also contacted the Fisheries section of the Department of Business, Industry and Resource Development and requested that future government publications note the site's protected status.

On these occasions it was not appropriate to also request that editors refer to non-disturbance mooring techniques, however if in the future the opportunity to do so arises, it should be mentioned.

9.4. Human threats to the site

Relevant aspects of legislation. The legislation offers a broadly worded and clear definition of what constitutes illegal activity and human disturbance. The following

actions are illegal under the *Historic Shipwrecks Act 1976* (as of May 2001 Part 2, section 13):

- destroys or causes damage to an historic shipwreck or historic relic; or
- causes interference with a historic shipwreck or historic relic; or
- causes the disposal of a historic shipwreck or historic relic; or
- causes a historic shipwreck or historic relic to be removed from Australia (including State waters).

Furthermore under section 9 of the legislation:

- a person is obligated to contact the minister [or the State/Territory delegate] if they are in possession, custody or control of an item protected under the legislation.

Therefore it is illegal to disturb or damage a shipwreck. It is also illegal to be in possession of protected relics which have not been formally registered.

As stated in section 9.2, the *SS Brisbane* shipwreck became protected following the 1993 legislative amendment, which deemed all shipwrecks older than 75 years and in Commonwealth waters protected. The amendment was retrospective, extending its authority over relics salvaged prior to 1993. As a side note it also required members of the public who know of shipwrecks, which were now protected, to notify the authorities of their location. As one would expect the amendment led to a marked increase across Australia of the number of shipwrecks and raised artefacts that were deemed protected under the Act (Green 1995:40-41, Jeffery n.d:13).

The 1993 Amnesty. In 1993 the Commonwealth government, in conjunction with State Delegates, ran a national amnesty on shipwrecks and raised relics. The purpose of this amnesty was to provide a mechanism for people to register their artefacts or share knowledge of sites, without fear of penalty. The Amnesty was the opportunity for members of the public to declare their interests or rights in relation to shipwrecks and relics. Members of the public were permitted to continue having custody of material but were required to register each item.

No shipwrecks or raised artefacts were declared in the Northern Territory. This was unique, and in some States hundreds of relics had been declared (Green 1995).

The Amnesty has long expired and people in possession of unregistered protected relics are in breach of the legislation. Despite the willingness of some divers to share stories of salvage with the author, and allow relics to be photographed, the possession of unregistered artefacts is illegal. Either these objects were salvaged prior to the Amnesty, and not registered, or they have been salvaged since the Amnesty.

The current position of the government on this matter is clear. The following quotation is from the website of the Commonwealth Department for the Environment and Heritage, which is responsible for the administration of the *Historic Shipwrecks Act*. It states:

‘The only historic shipwreck relics legally in circulation are those which have a registration certificate. The Historic Shipwrecks Act does not prevent private possession of certified shipwreck relics, nor the sale or disposal of these relics, but

it does regulate their transfer' (2002: <http://www.ea.gov.au/heritage/awh/shipwrecks/coins.html>).

Salvage as the principle human threat. The principal human threat to the conservation of the *SS Brisbane* shipwreck is salvage. Chapter 7 offers a history of salvage and a review of known raised relics. It will not be repeated here.

Salvage results in the disturbance of and damage to the wreck which threatens the site's overall preservation and compromises its integrity as an archaeological site. The removal of objects inhibits their scientific study,. Furthermore these relics have been removed from public space and added to private collections. This is a shift from public access to exclusive access. Finally relics salvaged by recreational divers are not professionally conserved and it is likely that they will deteriorate over time.

The group responsible for salvage on this site is recreational divers. Divers are responsible for the removal of material, but since the initial removal of the relics, they may have been sold or given to others. Therefore it may not be exclusively divers who are currently in possession of relics from the wreck.

Ironically, much of the information about salvage on this site has been learnt from recreational divers who are or were in the past responsible for salvage. This willingness to communicate, show relics and share personal histories, should be viewed as a positive and significant sign.

This sentiment aside, the legislation, and the policies of the Commonwealth Department for the Environment and Heritage are clear. Therefore the significance of this report is that it clearly identifies salvage by recreational divers as a primary threat to the site. Furthermore it offers evidence of this.

It is therefore a recommendation of this report that a copy of this report be sent to the Commonwealth Department for the Environment and Heritage with a covering letter that identifies salvage by recreational divers as a major threat to the site.

Mooring by all visitors. Theoretically, anchors that are dropped by visiting boats can cause damage to the wreck. Plough anchors can damage the shipwreck by either being dropped on the wreck, or pulling on the wreckage as they are retrieved. Grabble (or reef) anchors can damage the wreck by catching onto wreckage and pulling on the wreck as the boat drifts and when they are raised.

The dropping of anchors is a concern applicable to many historic shipwrecks and there is no evidence to suggest it is of particular concern in the management of this site.

It is not recommended that an alternative mooring system be created and made either voluntary or compulsory. The reasons for this are:

- There is no direct evidence that mooring practices have caused damage;
- Mooring systems can be expensive to maintain and there can be a problem of liability, if for example the system fails, and a boat drifts against a rocky terrace and the hull is damaged; and
- In terms of compulsory mooring, there is no evidence to warrant this level of visitation control. Furthermore it is unclear, in legal terms, how specific access regulations such as compulsory mooring systems can be imposed.

It is recommended that this issue of mooring be dealt with through interpretation initiatives. The interpretation produced for the general public should reiterate the protected status of the shipwreck, and interpretation aimed specifically at diver boat charters and recreational anglers should specify the need for appropriate mooring practices.

Fish Reef Navigation beacon. In 1986 the Department of Transport and Works commissioned Advanced Engineering to install a navigation beacon on Fish Reef. The beacon was installed in 1987.

The beacon is located over 50 metres away from the site. It is visible from sea level at a radius of 10 nautical miles, and so acts as a useful marker when travelling to the site.

Neither the beacon itself nor the annual maintenance checks threaten the shipwreck site in any way.

Military exercises. The nautical chart AUS 29 and Notice to Mariners No.9 (2002) indicates that military exercises are conducted approximately 6 nautical miles from the shipwreck. The Deputy Commander of Operations, Northern Command Headquarters was contacted to confirm if whether during past military exercises the site had been involved, disturbed or damaged.

Northern Commands assured that there is no record of interference or damage to the site.

9.5. Site deterioration caused by natural forces

Policies. The policies cited below are from authoritative sources and recommend that environmental processes that cause site deterioration be identified and measured, and if possible mechanisms should be implemented to halt or reduce their affect.

- 'In addition to historical and archaeological research, an environmental assessment should be carried out with practitioners from a relevant discipline to identify physical and chemical processes affecting site longevity and archaeological significance' (AIMA 1994:10).
- 'Preservation is appropriate where the existing fabric or its condition constitutes evidence of cultural significance' (Burra Charter 1999: Article 17).

Discussion. It is argued in this report that an environmental assessment by a practitioner from a relevant discipline, such as an on-site conservator or oceanographer, is not a high priority in site management.

It is clear from a site inspection that the dominant forces affecting the integrity and longevity of the shipwreck are the mechanical effects of wave, wind, surge and tide. To a lesser extent, corrosion is causing deterioration. Mechanical force is ongoing, however it is the seasonal monsoon conditions that cause the greatest damage, collapsing structure and shifting material both across or away from the site.

There are no practical solutions to counter these forces. An environmental assessment by a professional conservator would certainly explain the effect of these processes in greater detail, however it is unlikely that a solution for these processes could be offered.

The decision to not consider an environmental assessment a high priority should be reassessed following archaeological research.

If there is an opportunity to conduct an environmental assessment, the conservator should prioritise a corrosion potential survey of the stern section with the possibility of anode protection.

9.6. Interpretation and education

Policies. Authoritative policies dealing with interpretation and education are cited below. Education and interpretation are important to teach the public about a site's history, and to provide knowledge of a site's protected status.

- 'Protected shipwreck and associated relics should be interpreted for educative purposes' (AIMA 1994:8).
- 'Agencies should provide for adequate knowledge (and enforcement) of the legislation' (AIMA 1994:6).

Issues. As argued and explained in the assessment, the *SS Brisbane* shipwreck is of high educational significance. Education and interpretation are also important tools in site conservation. Firstly, they inform the public of legal protection. Secondly, educating the public about a site's historical and archaeological significance may increase their understanding of its value and therefore the need for conservation.

The following education and interpretation strategies are recommended:

(1) Brochure

A brochure should provide information about the site's history and archaeological significance, reference the site's protected status, promote visitation and assist in visitation by offering site location information, offer advice on dive conditions and offer mooring instructions.

(2) Laminated site-plan dive cards

A laminated site plan card would be a plastic card of approximately 20 centimetres by 10 centimetres which has a site plan printed on one side and written information printed on the other. The card would be waterproof and could be taken by divers under the water or carried aboard boats without fear of water damage. A hole could be stamped into the card to allow divers to clip the card to their dive vest. The card would be a form of interpretation aimed at anglers, divers and those who explore the wreck by foot. It would provide a guide or tour of the cultural remains and therefore enhance the visitor experience. It would provide a history of the site and inform the public of its protected status. The versatility and usefulness of the card would make it a valuable accessory to any site visit.

(3) A display at the NT Chinese Museum

The author met with the Chung Wah Society, who are a representative body of the Chinese community of the Northern Territory. The organisation operates a cultural centre which includes the Northern Territory Chinese Museum.

A publication of the Chung Wah Society states that 'The Chung Wah Hall also houses our historical museum, which exhibits a comprehensive history of Chinese settlement in the Northern Territory' (Chung Wah Society 2001).

At the meeting it was proposed that a display on Chinese immigrant ships, with a particular focus on the *SS Brisbane*, be designed and housed at the Chinese Museum. This would educate the public as to the role of the *SS Brisbane* as a Chinese immigrant ship.

The display would include raised relics from the shipwreck, loaned from the MAGNT collection.

(4) Underwater plinth

Underwater plinths are a popular method of providing permanent on-site interpretation (State Heritage Branch, South Australia 1996. AIMA1996:35).

It is recommended that an underwater plinth be designed and placed at the stern section of the shipwreck. This is the most dominant feature of the shipwreck and divers would visit this feature over the course of their dive. The plinth should list key historical information and reference the protected status of the site.

If in the future there is evidence that more visitors are exploring wreckage by foot at low tide then a second plinth should be placed on the raised plateau of the reef.

(5) Ramp signage

The site is not accessed from a single boat ramp. Rather people may launch trailer boats from a variety of entrance points. Therefore it would not be an effective measure to place signage about the site at specific boat ramps.

(6) Fishing publications

As discussed in section 9.3, local government and commercially produced fishing publications should also be targeted in interpretation initiatives. All visitors, including anglers, should be aware of the shipwreck's protected status. Also it is possible that anglers are involved in a variety of activities on the site other than fishing, for example exploring wreckage by foot or diving.

9.7. Administrative Structure

Policy. It is recommended that a clear administrative structure for site management be outlined (Burra Charter 1999: Article 29).

Administrative structure. The Director of the MAGNT is the delegated authority of the *Historic Shipwrecks Act* in the Northern Territory.

The role of the delegated authority is to administer the legislation and implement a management program.

The delegated authority is not responsible for the safety or well being of members of the public who visit the shipwreck for any purpose.

9.8. Records and documentation

Copies of historical documents, interview summaries, the fieldwork diary and survey results are filed in the NT shipwreck database located in the Maritime History and Archaeology office of the MAGNT.

Historical and fieldwork images are stored in slide and CD format in the same office. Photographs of relics held in the MAGNT collection were shot on 120 colour transparencies and are again stored in the same office.

Correspondence relating to the management of the site is filed in the MAGNT government file BP 2000/378.

CHAPTER 10: MANAGEMENT STRATEGIES; IMPLEMENTING POLICY

Recommendations have been ranked in terms of importance.

Recommendation 1

That a copy of this report be sent to the Commonwealth Department for the Environment and Heritage with a cover letter that identifies salvage by recreational divers as a major threat to the site.

Recommendation 2

To produce a brochure on the site.

Recommendation 3

To design and install a display on the shipwreck and Chinese immigration ships at the Northern Territory Chinese Museum.

Recommendation 4

To produce a laminated site plan card for visitors.

Recommendation 5

To produce and install an underwater plinth.

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APPENDIX

1. 2000 Surface Collection

In September 2000 the MAGNT collected 11 pieces of ceramic and one piece of coal from the site.

The purpose of this was two-fold. Firstly, the ceramics will serve as a sample of ceramics from the site. It will be used by the MAGNT to help identify whether relics held in private collection are from the shipwreck. The second purpose of the collection was to recover a sample of ceramics because they were under threat from salvage and natural forces.

The coal was taken because it was under threat and for research purposes. The coal's source may be identified, which would contribute to our knowledge of coal ports and the early steamship trade.

All of the ceramic pieces, except for one are approximately 10cms in diameter. One is approximately twice that size. The sample was not taken from a controlled area but rather collected from across the reef's plateau. None of the objects that were collected had been found in their original deposition. Rather they were scattered across the reef over 50 metres away from the wreck. The location of artefacts were recorded prior to their collection. Salvaged relics have undergone a controlled desalination process.

Table 2. Surface Collection 2000

Item	MAGNT no.
small white ceramic shard	Receipt 0610.1
small white ceramic shard	Receipt 0610.2
ceramic shard- blue and white dragon pattern	Receipt 0610.3
small white ceramic shard	Receipt 0610.4
grey ceramic shard	Receipt 0610.5
section of ceramic jar base	Receipt 0610.6
brown ceramic shard	Receipt 0610.7
ceramic shard with blue and white pattern	Receipt 0610.8
piece of coal	Receipt 0610.9

2. Site access in relation to tide

Tide is an important consideration if planning a visit to the *SS Brisbane* shipwreck. If a group is planning to explore wreckage on the higher reef plateau by foot, they will need to time their visit to coincide with the peak of the spring low tide. A suitable tide level is 0.90 metres or below.

As an example, the survey team visited the reef on 18 October 2001. The table below shows the tidal movement for that day. The team worked approximately 2 hours either side of the low tide, which peaked at 13:48.

Table 3. Tide levels on 18 October 2001

Time	7:13	13:48	20:07
Tide	7.36	0.24	7.65

Figure 40 shows the exposure of various cultural material in the intertidal zone at 0.24 metres tide. Figure 41 was taken at the same time but the photographer turned on the spot 180°. It shows the spring low tide line and wreckage descending into the water.



Fig. 40. Cultural material at 0.24 metres tide (photo: S. Jung)



Fig. 41. Midsection and stern at 0.24 metres tide (photo: S. Jung)

If a group is planning to scuba dive the submerged section of the shipwreck site the best time to visit is during a Neap tide slack water, or minor flooding tide in a Neap tide cycle. A minor flooding tide brings cleaner open-ocean water across the shipwreck onto the reef. An ebbing tide tends to bring particles from the reef and coast onto the wreck. If diving during slack water, the current is calmer but particles remain suspended reducing visibility.

3. Site access in relation to seasons

Apart from tide, wind strength is the most significant factor to consider when planning a site visit. The following is only a broad guide and selecting the correct time for visitation must take into account daily weather forecasts. Furthermore, regardless of the weather forecast, it is imperative to remember that Fish Reef is in unsheltered waters, with no islands or bays close by.

The Northern Territory seasons are characterised as the Wet season (December-March) and the Dry season (May-August) with transitional periods in between.

The Wet season is characterised by a north-west or West Monsoon wind pattern. The winds can range between calm, variable and squalls (Australian Pilot 1992: Vol.5 :34). Associated weather is high humidity and high rainfall. Tropical depressions, storms and cyclones can develop in the Wet season. The strengths of these can vary but can rise above 34-40 knots and at times exceed 64 knots (Australian Pilot 1992: Vol.5 :31). High winds can also produce abnormally high tides, seas and swell (Australian Pilot, Vol 5, 1992: 17,22).

The Dry season is characterised by a south-east wind pattern and is generally associated with calmer and more stable conditions than the Wet season. Winds are on average 11-21 knots, though can be stronger (Australian Pilot, Vol 5, 1992: 34).

The best time to visit the *SS Brisbane* shipwreck is during the transitional season from the Dry to the Wet season. This occurs between October and December (Australian Pilot, Vol 5, 1992: 34). During this time, before the wind pattern shifts to the north-west pattern, the south-east winds are moderate.

4. Survey Strategy

The small scale site plan presented in the report only shows some of the cultural material located in the intertidal zone. It was decided that, in this case, a survey and mapping strategy that would eventually result in maps of greater accuracy is a better strategy than producing an immediate but rough site sketch of the entire site. It was foreseen that the mapping process would not be completed by the end of this project.

The survey strategy was a chain survey procedure, using planning grids where appropriate. A rectangle datum structure was formed, made up of two right angle triangles. The rectangle measured 80 by 60 metres. Neither the slope of the topography nor the height of cultural material was factored into the survey.

Planning grids were used to capture that material that was relatively flat and detailed. The finest square in each planning grid was 1 metre in size. Features seen within the 1 metre² frame were sketched onto graph paper, which had borders representing 1 metre² already drawn on them.

Table 4 shows the hours spent on the site for the dry reef survey.

Table 4. Dry Reef fieldwork

Date	Approximate hours on site
26 October 2000	4 hours
27 October 2000	4 hours
28 October 2000	4 hours
29 October 2000	4 hours
17 October 2001	4 hours
18 October 2001	4 hours
19 October 2001	4 hours
21 October 2001	4 hours

Table 5 shows the total time spent underwater diving the submerged material by the author and his dive partners (dive buddies).

Table 5. Diving fieldwork

Diver	Total time underwater
Jan Watson	45 minutes
Jo Boyanton	63 minutes
Paul Clark	95 minutes
Silvano Jung	70 minutes
David Steinberg	273 minutes

5. Relics in the MAGNT collection

Table 6. Items within collection (discounting 2000 surface collection)

Item	Collection number
bower anchor	TH82.5
brass lock	M91.27
ship's bell	M89.08
3 shoes	R06109.1,2,3
jar lid	not allocated

6. Photographic Index

The index includes fieldwork images, various historical images and *SS Brisbane* relics held in the MAGNT collection, including the material collected in the 2000 season. It also includes images taken by Paul Clark in 1990. The index does not include photographs of relics held in private collections.

Table 7. Image index

Image no.	Photographer	Description
1990-1	P. Clark	stream anchor, bow and boiler, view from aft

1990-2	P. Clark	main boiler and chain leading to bower anchor
1990-3	P. Clark	stream anchor, bow and boiler, view from aft
1990-4	P. Clark	looking at reef wreckage from rudder post
1990-5	P. Clark	reef terraces at west edge
1990-6	P. Clark	bower anchor and chain
1990-7	P. Clark	wash-port lid (scrubber)
1990-8	P. Clark	main boiler and various hull debris
1990-9	P. Clark	bollard section at main boiler (NW face)
1990-10	P. Clark	hull debris aft of bow
1990-11	P. Clark	anchor and hull ribs, facing NW
1990-12	P. Clark	anchor and hull ribs, facing NW
1990-13	P. Clark	beam close to chain and winch at bow
1990-14	P. Clark	stream or ketch anchor, not located in 2000/01
1990-15	P. Clark	aft of bow, winch and hull debris
1990-16	P. Clark	windlass, davits, keel and bow, facing NW
1990-17	P. Clark	windlass, davits, keel and bow, facing NW
1990-18	P. Clark	hook, located aft of bow, close to mast section
1990-19	P. Clark	bow, chain, winch, windlass
1990-20	P. Clark	stream anchor, note port rim deadlight
1990-21	P. Clark	looking at exposed wreckage from water, facing SE
1990-22	P. Clark	plate with chequered pattern
1990-23	P. Clark	iron knob on reef
1990-24	P. Clark	iron knob on reef
1990-25	P. Clark	section of mast, located aft of bow
1990-26	P. Clark	port bow, section of stem, chain
1990-27	P. Clark	stern steering mechanism, attached to stern post
1990-28	P. Clark	stern steering mechanism, attached to stern post
1990-29	P. Clark	SW end of Fish Reef with wreckage in view
1990-30	P. Clark	SE storage tank
1990-31	P. Clark	fluke of stream anchor and 'brass port rum'
1990-32	P. Clark	SE water tank
1990-33	P. Clark	SE water tank, beacon and boiler in distance
1990-34	P. Clark	rectangle storage tank close to bow
1990-35	P. Clark	rectangle storage tank close to bow
1990-36	P. Clark	winch on reef east of bow
1990-37	P. Clark	winch on reef east of bow

1990-38	P. Clark	Fish Reef beacon facing North.
1990-39	P. Clark	windlass, located close to bow
1990-40	P. Clark	winch with storage tank in background
1990-41	P. Clark	winch with storage tank in background
1990-42	P. Clark	main boiler, windlass, rear of bow
1990-43	P. Clark	main boiler, windlass, rear of bow
1990-44	P. Clark	bower anchor, main boiler, capstan windlass, seen as looking westward.
1990-45	P. Clark	hook and unidentified metal reel.
1990-46	P. Clark	brass porthole, located near stream anchor (see 09-49)
1990-47	P. Clark	brass porthole, located near stream anchor (see 09-48)
1990-48	P. Clark	stream anchor, not located in 2000, porthole by left fluke
1990-49	P. Clark	main boiler, aft ribs, chain and stock of bower anchor
1990-50	P. Clark	hook and unidentified metal reel
1990-51	P. Clark	main bower anchor and hull plating
1990-52	P. Clark	main bower anchor and hull plating
1990-53	P. Clark	stream anchor with twisted stock
1990-54	P. Clark	stream anchor with twisted stock
1990-55	P. Clark	davits and capstan
1990-56	P. Clark	davits and capstan
1990-57	P. Clark	rear of main boiler and bower anchor
1990-58	P. Clark	rear of main boiler and bower anchor
1990-59	P. Clark	main boiler, capstan, windlass and bower anchor
1990-60	P. Clark	main boiler, capstan, windlass and bower anchor
1990-61	P. Clark	rear of bow, winch and chain
1990-62	P. Clark	rear of bow, winch and chain
1990-63	P. Clark	main boiler, capstan, windlass and bower anchor
1990-64	P. Clark	boiler and windlass, at half flood tide
1990-65	P. Clark	boiler and windlass, at half flood tide
1990-66	P. Clark	windlass at flooding tide, Tim Proctor and Richard Wilson
1990-67	P. Clark	windlass at flooding tide, Tim Proctor and Richard Wilson
1990-68	P. Clark	windlass at flooding tide, Tim Proctor and Richard Wilson
1990-69	P. Clark	windlass at flooding tide, Tim Proctor and Richard Wilson

1990-70	P. Clark	bow, boiler and hull debris at flooding tide
1990-71	P. Clark	bow, boiler and hull debris at flooding tide
1990-72	P. Clark	SE storage tank and beacon
1990-73	P. Clark	SE storage tank and beacon
1990-74	P. Clark	stream anchor, not located in 2000
1990-75	P. Clark	stream anchor, not located in 2000
1990-76	P. Clark	stream anchor, not located in 2000
1990-77	P. Clark	wreckage viewed from water at flooding tide
1990-78	P. Clark	winch east of bow
1990-79	P. Clark	winch east of bow
1990-80	P. Clark	skipper, Tim Proctor, Richard Wilson rowing away
1990-81	P. Clark	skipper, Tim Proctor, Richard Wilson rowing away
1990-82	P. Clark	boat used by group to visit, passengers aboard
1990-83	P. Clark	boat used by group to visit, passengers aboard
1990-84	P. Clark	stream anchor with twisted stock
1990-85	P. Clark	unidentified machinery or parts (see 2000.33)
1990-86	P. Clark	unidentified machinery or parts (see 2000.33)
2000-01	D. Steinberg	exposed aft ribs and steering column
2000-02	D. Steinberg	exposed aft ribs and steering column
2000-03	D. Steinberg	nth face of main boiler
2000-04	D. Steinberg	nth face of main boiler
2000-05	D. Steinberg	left profile of main boiler
2000-06	D. Steinberg	winch in triangle datum
2000-07	D. Steinberg	winch in triangle datum
2000-08	D. Steinberg	winch in triangle datum with beacon
2000-09	D. Steinberg	donkey boiler with grid
2000-10	D. Steinberg	face of donkey boiler
2000-11	D. Steinberg	profile of donkey boiler
2000-12	D. Steinberg	profile of donkey boiler
2000-13	D. Steinberg	face of donkey boiler
2000-14	D. Steinberg	face of donkey boiler
2000-15	D. Steinberg	water tank in datum
2000-16	D. Steinberg	water tank in datum
2000-17	D. Steinberg	water tank in datum with beacon
2000-18	D. Steinberg	windlass
2000-19	D. Steinberg	windlass

2000-20	D. Steinberg	windlass and chain
2000-21	D. Steinberg	keel
2000-22	D. Steinberg	keel
2000-23	D. Steinberg	boiler, windlass, davits
2000-24	D. Steinberg	davits by windlass
2000-25	D. Steinberg	capstan and bow
2000-26	D. Steinberg	capstan
2000-27	D. Steinberg	mast with winch and chain behind
2000-28	D. Steinberg	winch, chain and bow
2000-29	D. Steinberg	winch, chain and bow
2000-30	D. Steinberg	windlass and capstan
2000-31	D. Steinberg	hull sheeting - small
2000-32	D. Steinberg	hull sheeting - small
2000-33	D. Steinberg	debris with capstan spool
2000-34	D. Steinberg	hull sheeting - small
2000-35	D. Steinberg	anchor by bow, with beacon
2000-36	D. Steinberg	hull sheeting - large, with beacon
2000-37	D. Steinberg	ceramic shard insitu
2000-38	D. Steinberg	ceramic shard (no.10) insitu
2000-39	D. Steinberg	Chinese coin insitu (on 00-31)
2000-40	D. Steinberg	Chinese coin insitu
2000-41	D. Steinberg	ceramic shard (no.10) insitu
2000-42	D. Steinberg	equipment
2000-43	D. Steinberg	aft wreckage past keel
2000-44	D. Steinberg	hull sheeting and ribs -large
2000-45	D. Steinberg	close up of (00-44)
2000-46	D. Steinberg	close up of (00-44)
2000-47	D. Steinberg	close up of (00-44)
2000-48	D. Steinberg	close up of (00-44)
2000-49	D. Steinberg	close up of (00-44)
2000-50	D. Steinberg	close up of (00-44)
2000-51	D. Steinberg	close up of (00-44)
2000-52	D. Steinberg	close up of (00-44)
2000-53	D. Steinberg	small anchor aft of larger
2000-54		painting of Brisbane
		Queensland Maritime Museum Association

2000-55		painting of Brisbane Queensland Maritime Museum Association
2000-56	D. Steinberg	Chinese immigrants on Brisbane <i>Illustrated Sydney News</i> 1881 Vol. 18, no.7
2000-57	D. Steinberg	Chinese immigrants on Brisbane <i>Illustrated Sydney News</i> 1881 Vol. 18, no.7
2000-58	D. Steinberg	map; location of Brisbane, Australian
2000-59	D. Steinberg	site plan; symbols marking locations
2000-60	D. Steinberg	cover of E&A handbook
2000-61	D. Steinberg	cover of E&A handbook
2000-62	D. Steinberg	wreck from boat; mid tide
2000-63	D. Steinberg	wreck from boat, mid tide
2000-64	D. Steinberg	navy and illegal fishing boats
2000-65	D. Steinberg	fishing boat on Fish Reef
2000-66	D. Steinberg	fishing boat on Fish Reef
2000-67	D. Steinberg	fishing boat on Fish Reef
2000-68	D. Steinberg	fishing boat on Fish Reef
2000-69	D. Steinberg	wide view - bow and boiler
2000-70	D. Steinberg	wide view - 2 boilers
2000-71	D. Steinberg	wide view - boiler, bow, beacon
2000-72	D. Steinberg	wide view - bow keel, boiler
2001-01	D. Steinberg	gunwale with bollards, and grid
2001-02	D. Steinberg	large hull debris, grid and workers
2001-03	D. Steinberg	large hull debris, grid and workers
2001-04	D. Steinberg	large hull debris, grid and workers
2001-05	D. Steinberg	large hull debris, grid and workers
2001-06	D. Steinberg	wreckage at ebbing tide
2001-07	D. Steinberg	wreckage at ebbing tide
2001-08	D. Steinberg	wreckage at ebbing tide
2001-09	S. Jung	bow, boiler and moored Barefoot 1
2001-10	S. Jung	view of bow taken from aft hull debris
2001-11	S. Jung	line of aft rib structure
2001-12	S. Jung	aft hull debris and steering column
2001-13	S. Jung	measuring smaller anchor
2001-14	S. Jung	hull plating and bow
2001-15	S. Jung	aft ribs structure and steering column

2001-16	S. Jung	main boiler, bow and beacon
2001-17	S. Jung	bow, chain and winch
2001-18	S. Jung	debris close to gunwale section
2001-19	S. Jung	donkey boiler - profile
2001-20	S. Jung	donkey boiler- face
2001-21	S. Jung	boiler, anchor, bow and beacon
2001-22	S. Jung	main boiler - face
2001-23	S. Jung	bow related debris viewed from aft
2001-24	S. Jung	exposure of aft at .80 tide
2001-25	S. Jung	donkey boiler face
2001-26	S. Jung	aft debris and steering column
2001-27	S. Jung	hull sheeting - large and beacon
2001-28	S. Jung	large anchor and bow
2001-29	S. Jung	donkey boiler - profile
2001-30	S. Jung	aft ribbing, aft anchor and steering column
2001-31	S. Jung	bow and large anchor from aft
2001-32	S. Jung	over exposed (not scanned)
2001-33	S. Jung	overexposed (not scanned)
2001-34	S. Jung	overexposed (not scanned)
2001-35	S. Jung	main anchor and Barefoot one in background
2001-36	S. Jung	hull plating and navigation beacon
2001-37	S. Jung	hull debris, water tank (within 2000 datum)
2001-38	S. Jung	hull, keel and bow
2001-39	S. Jung	wreck exposure with ebbing tide
2001-40	S. Jung	wreck exposure with ebbing tide
2001-41	S. Jung	wreck exposure with ebbing tide
2001-42	S. Jung	wreck exposure with ebbing tide
2001-43	S. Jung	wreck exposure with ebbing tide
2001-44	S. Jung	wreck exposure with ebbing tide
2001-45	S. Jung	wreck exposure with ebbing tide
2001-46	S. Jung	wreck exposure with ebbing tide
2001-47	S. Jung	hull plating - ribs up
2001-48	S. Jung	hull plating (associated with 01-47)
2001-49	S. Jung	hull plating (associated with 01-47)
2001-50	S. Jung	hull plating (associated with 01-47)
2001-52	S. Jung	hull plating (associated with 01-47)

2001-53	S. Jung	hull plating (associated with 01-47)
2001-54	S. Jung	hull plating (associated with 01-47)
2001-55	S. Jung	hull plating (associated with 01-47)
2001-56	S. Jung	wreck exposure with ebbing tide
2001-57	S. Jung	wreck exposure with ebbing tide
2001-58	S. Jung	wreck exposure with ebbing tide
2001-59	S. Jung	south water tank with beacon
2001-60	S. Jung	south water tank
2001-61	S. Jung	south water tank
2001-62	S. Jung	south water tank
2001-63	S. Jung	south water tank from a distance
2001-64	S. Jung	south east water tank
2001-65	S. Jung	south east water tank
2001-66	S. Jung	south east water tank
2001-67	S. Jung	south east water tank
2001-68	S. Jung	beacon
2001-69	S. Jung	main boiler, view of face and profile
2001-70	S. Jung	hull debris with porthole space
2001-71	S. Jung	close up of (01-70)
2001-72	S. Jung	gunwale
2001-73	S. Jung	gunwale
2001-74	S. Jung	gunwale
2001-75	S. Jung	winch located within 2000 datum
2001-76	S. Jung	view of bow and Barefoot 1 from reef
2001-77	S. Jung	debris
2001-78	S. Jung	hull debris and 2 water tanks in background
2001-79	S. Jung	D. Steinberg and Jamie Patterson on Barefoot 1
2001-80	S. Jung	bow, keel and aft debris
2001-81	D. Steinberg	high tide from beacon
2001-82	D. Steinberg	high tide from beacon
2001-83	D. Steinberg	high tide from beacon
2001-84	D. Steinberg	high tide from beacon
2001-85	D. Steinberg	towing tinny
2001-86	D. Steinberg	towing tinny
2001-87	D. Steinberg	high tide form beacon
2001-88	D. Steinberg	high tide from beacon

2001-89	D. Steinberg	high tide from beacon
2001-90	D. Steinberg	high tide from beacon
2001-91	D. Steinberg	moored nth of beacon
2001-92	D. Steinberg	beacon ladder from top
2001-93	D. Steinberg	solar panels prior to cleaning
2001-94	D. Steinberg	changing beacon globes
2001-95	D. Steinberg	high tide from beacon
2001-96	D. Steinberg	high tide from beacon
2001-97	D. Steinberg	high tide from beacon
2001-98	D. Steinberg	moored nth of beacon
2001-99	D. Steinberg	moored nth of beacon
2001-100	D. Steinberg	mark on platform
2001-101	D. Steinberg	solar panels
2001-102	D. Steinberg	towing tinny at sunrise
2001-103	D. Steinberg	moored nth of beacon
2001-104	D. Steinberg	checking beacon batteries
2001-105	D. Steinberg	cleaning shit of panels
2001-106	D. Steinberg	changing beacon globes
2001-107	D. Steinberg	batteries, panels, beacon
2001-108	G. Herrada	Brisbane bell with scale (B&W)
2001-109	G. Herrada	Brisbane bell (B&W)
2001-110	G. Herrada	collected in 2000 (0610.1-0610.9) (B&W)
2001-111	G. Herrada	Chinese shoes (B&W)
2001-112	G. Herrada	anchor (TH 82.5) (B&W)
2001-113	G. Herrada	anchor (TH 82.5) (B&W)
2001-114	G. Herrada	admiralty chart (TH 82.006) (B&W)
2001-115	G. Herrada	Chinese shoes (B&W)
2001-116	G. Herrada	Brisbane bell (B&W)
2001-117	G. Herrada	collected in 2000 (0610.1-0610.9) (B&W)
2001-118	G. Herrada	admiralty chart (TH 82.006) (B&W)
2001-119	G. Herrada	anchor (TH82.5) (job 79/S1/1)
2001-120	G. Herrada	anchor (TH82.5) (job 79/S1/2)
2001-121	G. Herrada	anchor (TH82.5) (job 79/S1/3,4)
2001-120	G. Herrada	anchor (TH82.5) (job 79/S1/5)
2001-121	G. Herrada	anchor (TH82.5) (job 79/S1/6)
2001-122	G. Herrada	anchor (TH82.5) (job 79/S1/7)

2001-123	G. Herrada	anchor (TH82.5) (job 79/S1/8)
2001-124	G. Herrada	anchor (TH82.5) (job 79/S1/9,10)
2001-125	G. Herrada	anchor (TH82.5) (job 79/S2/11)
2001-126	G. Herrada	anchor (TH82.5) (job 79/S2/12)
2001-127	G. Herrada	admiralty chart (TH 82.006) (job 79/S2/11b)
2001-128	G. Herrada	admiralty chart (TH 82.006) (job 79/S2/12b)
2001-129	G. Herrada	bell (M89.08) (job 79/S2/11c)
2001-130	G. Herrada	bell (M89.08) (job 79/S2/12c)
2001-131	G. Herrada	bell (M89.08) (job 79/S3/1)
2001-132	G. Herrada	bell (M89.08) (job 79/S3/2)
2001-133	G. Herrada	bell (M89.08) (job 79/S3/3)
2001-134	G. Herrada	bell (M89.08) (job 79/S3/4)
2001-135	G. Herrada	bell (M89.08) (job 79/S3/5)
2001-136	G. Herrada	bell (M89.08) (job 79/S3/6)
2001-137	G. Herrada	admiralty chart (TH82.006) (job 79/S3/7)
2001-138	G. Herrada	admiralty chart (TH82.006) (job 79/S3/8)
2001-139	G. Herrada	admiralty chart (TH82.006) (job 79/S3/9)
2001-140	G. Herrada	admiralty chart (TH82.006) (job 79/S4/1)
2001-141	G. Herrada	admiralty chart (TH82.006) (job 79/S4/2)
2001-142	G. Herrada	admiralty chart (TH82.006) (job 79/S4/3)
2001-143	G. Herrada	admiralty chart (TH82.006) (job 79/S4/4,5)
2001-144	G. Herrada	bell (M90.08) (job 79/S4/6)
2001-145	G. Herrada	bell (M90.08) (job 79/S4/7)
2001-146	G. Herrada	bell (M90.08) (job 79/S4/8)
2001-147	G. Herrada	bell (M90.08) (job 79/S4/9,10)
2001-148	G. Herrada	ceramic shard (R0610.8) (job 79/S5/1)
2001-149	G. Herrada	ceramic shard (R0610.4) (job 79/S5/2)
2001-150	G. Herrada	ceramic shard (R0610.4) (job 79/S5/3)
2001-151	G. Herrada	ceramic shard (R0610.10) (job 79/S5/4)
2001-152	G. Herrada	ceramic shard (R0610.10) (job 79/S5/5)
2001-153	G. Herrada	coal (R0610.9) (job 79/S5/6)
2001-154	G. Herrada	coal (R0610.9) (job 79/S5/7)
2001-155	G. Herrada	ceramic shard (R0610.6) (job 79/S5/8)
2001-156	G. Herrada	ceramic shard (R0610.6) (job 79/S5/9)
2001-157	G. Herrada	Chinese shoe (R0610.9.1) (job 79/S5/10)
2001-158	G. Herrada	Chinese shoe (R0610.9.1) (job 79/S5/11)

2001-160	G. Herrada	Chinese shoe (R0610.9.2) (job 79/S5/12)
2001-161	G. Herrada	Chinese shoe (R0610.9.2) (job 79/S6/1)
2001-162	G. Herrada	Chinese shoe (R0610.9.3) (job 79/S6/2)
2001-163	G. Herrada	Chinese shoe (R0610.9.3) (job 79/S6/3)
2001-164	G. Herrada	Chinese shoes (R0610.9.1-.3) (job 79/S6/4)
2001-165	G. Herrada	Chinese shoes (R0610.9.1-.3) (job 79/S6/5)
2001-166	G. Herrada	Chinese shoes (R0610.9.1-.3) (job 79/S6/6)
2001-167	G. Herrada	Chinese shoes (R0610.9.1-.3) (job 79/S6/7)
2001-168	G. Herrada	ceramics & coal (R0610.9.1-.10) (job 79/S6/9)
2001-169	G. Herrada	ceramics & coal (R0610.9.1-.10) (job 79/S6/10)
2001-170	G. Herrada	ceramics & coal (R0610.9.1-.10) (job 79/S6/11)
2001-171	G. Herrada	ceramics & coal (R0610.9.1-.10) (job 79/S6/12)
2001-172	G. Herrada	ceramic shard (R0610.9.3) (job 79/S7/2)
2001-173	G. Herrada	ceramic shard (R0610.9.3) (job 79/S7/3)
2001-174	G. Herrada	ceramic shard (R0610.9.7) (job 79/S7/4)
2001-175	G. Herrada	ceramic shard (R0610.9.7) (job 79/S7/5)
2001-176	G. Herrada	ceramic shard (R0610.9.1) (job 79/S7/6)
2001-177	G. Herrada	ceramic shard (R0610.9.1) (job 79/S7/7)
2001-178	G. Herrada	ceramic shard (R0610.9.2) (job 79/S7/8)
2001-179	G. Herrada	ceramic shard (R0610.9.2) (job 79/S7/9)
2001-180	G. Herrada	ceramic shard (R0610.9.5) (job 79/S7/10)
2001-181	G. Herrada	ceramic shard (R0610.9.5) (job 79/S7/11)
2002-25	Marine Branch, Transport and Works	aerial image of site
2002-27	D. Steinberg	brass lock M91.27
2002-28	D. Steinberg	brass lock M91.27

